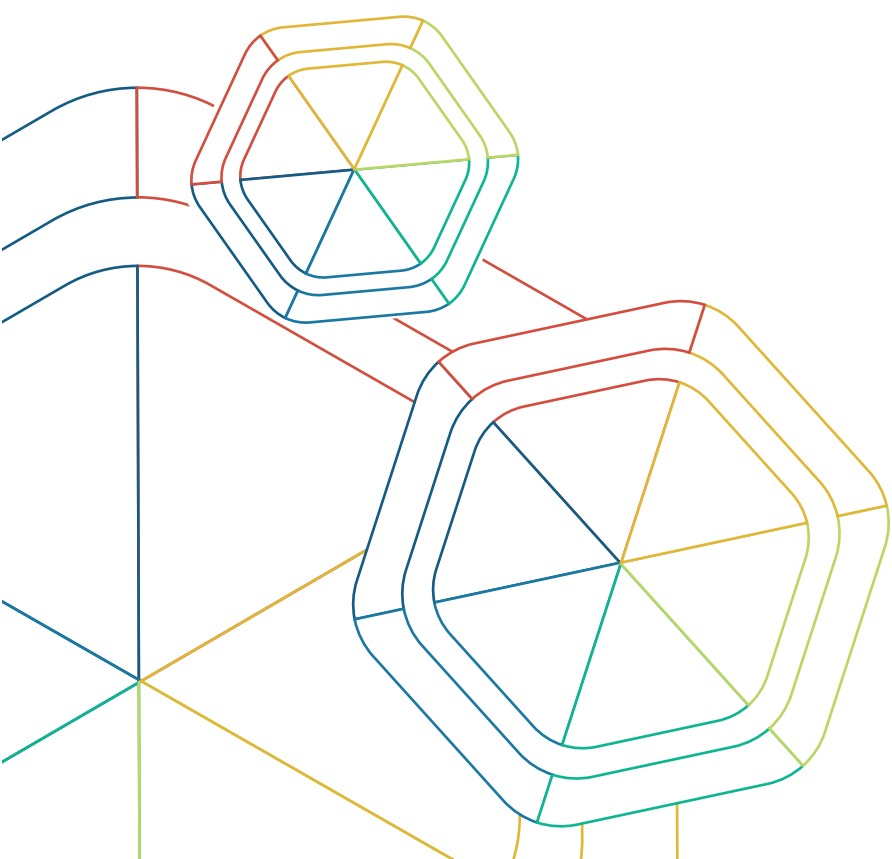


Reader's Guide to the School Report

PISA for Schools

2020



PISA for Schools
Reader's Guide to the School Report :
How Your School Compares Internationally
2020

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"If all we do is teach our children what we know,
they might remember enough to follow in our footsteps;
but if we teach them how to learn, they can go anywhere they want."
- *Andreas Schleicher, OECD Director for Education and Skills*

Foreword

PISA collects high-quality data and combines that with information on wider social outcomes; and it makes that information available to educators and policy makers so they can make more informed decisions. While the international PISA assessment provides aggregate national results for international comparisons and helps inform policy discussions among Ministers of Education, the PISA-based Test for Schools is designed to provide school-level results to educators and school leaders working at the front-line to improve student learning outcomes and well-being.

Like PISA, the PISA-based Test for Schools measures 15-year-old students' applied knowledge and skills in reading, mathematics and science. The assessment seeks not only to determine whether students can reproduce knowledge, but also how well they can extrapolate from what they have learned and apply it in unfamiliar settings, both within and outside of school.

If your school has conducted the PISA-based Test for Schools and is eligible, you will have received a School Report that presents your students' results using the same frameworks and scaling as PISA. Your School Report will allow you to compare your students' levels of proficiency in reading, mathematics and science with the levels of other students in your country and in the OECD. The results can be used as a gauge of how prepared students at your school are to succeed in a global economy.

We have prepared this Reader's Guide as companion volume to your School Report. It will provide you with useful background and reference material and help you in navigating the rich data provided by PISA-based Test for Schools.

I wish you every success in exploring your results and leveraging insights from comparative data and international experience to develop an appropriate and tailored set of actions that are unique to Your School.

Andreas Schleicher
Director, Directorate for Education and Skills
Special Advisor on Education Policy to the Secretary-General
OECD



Acknowledgments

This Reader's Guide has been designed to complement the School Reports generated by the PISA for Schools project based on the results of the PISA-based Test for Schools (known as the OECD Test for Schools in the United States).

The digital assessment is provided by Janison Ltd Pty, which serves as the International Platform Provider for the PISA-based Test for Schools, in partnership with the OECD.

Strategic guidance and oversight of the PISA for Schools project is provided by Andreas Schleicher and Yuri Belfali with Joanne Caddy.

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1. INTRODUCTION

This Reader's Guide is designed as a companion volume to help you explore your School Report which presents the key results from the PISA-based Test for Schools (PBTS) (known as the OECD Test for Schools [OTS] in the United States) and the OECD Programme for International Student Assessment (PISA).

In order to interpret the data included in the School Report accurately, readers need to be familiar with several concepts and methods used in competence-based assessments such as PISA and the PISA-based Test for Schools. This Reader's Guide was prepared by the OECD to provide a useful compendium of all the key concepts and methods discussed in the School Report.

Most of figures and charts included in the School Report are straightforward, but at times they contain greater insights than meets the eye at first glance. This Reader's Guide offers detailed descriptions of how each one should be interpreted.

Your feedback on how to improve this Reader's Guide are very welcome, and we invite you to contact the OECD PISA for Schools team with your comments and suggestions at PISAforSchools@oecd.org.



2. WHAT IS PISA?

What is the OECD Programme for International Student Assessment (PISA)?

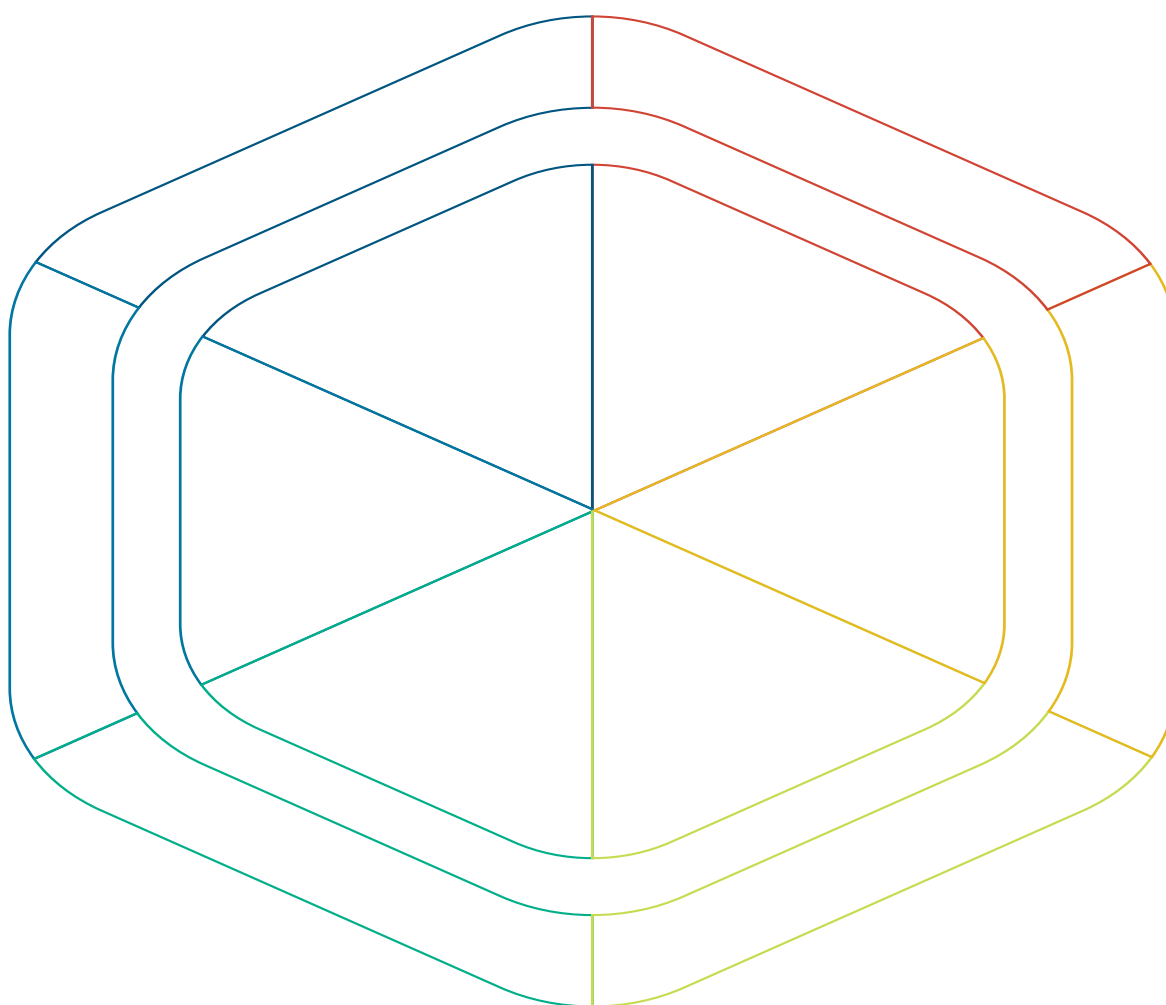
In response to the need for internationally comparable evidence on student performance, the OECD carries out the triennial survey of 15-year-old students around the world, known as the OECD Programme for International Student Assessment (PISA). PISA assesses the extent to which 15-year-old students, near the end of their compulsory education, have acquired key knowledge and skills that are essential for full participation in modern societies. The assessment focuses on the core school subjects of reading, mathematics and science. Students' proficiency in an innovative domain is also assessed (in PISA 2018, for example, this domain was global competences). The assessment does not just ascertain whether students can reproduce knowledge; it also examines how well students can extrapolate from what they have learned and can apply that knowledge in unfamiliar settings, both inside and outside of school. This approach reflects the fact that modern economies reward individuals not for what they know, but for what they can do with what they know.

PISA results reveal what is possible in education by showing what students in the highest-performing and most rapidly improving education systems can do. The findings allow policy makers around the world to measure the knowledge and skills of students in their own countries and in their schools in comparison with those in other countries. Using this information, they can set policy targets against measurable goals achieved by other education systems and learn from policies and practices applied elsewhere.

PISA benefits from its worldwide scope and its regularity. More than 90 countries and economies have taken part in PISA so far and the surveys, which are carried out every three years, allow participating countries and economies to track their progress in meeting key learning goals. PISA is the only international education survey to measure the knowledge and skills of 15-year-olds. In 2018, 600 000 students took part in PISA and sat the 2-hour PISA test, representing about 32 million 15-year-olds in the schools of 79 participating countries and economies.

PISA is also unique in the way it looks at:

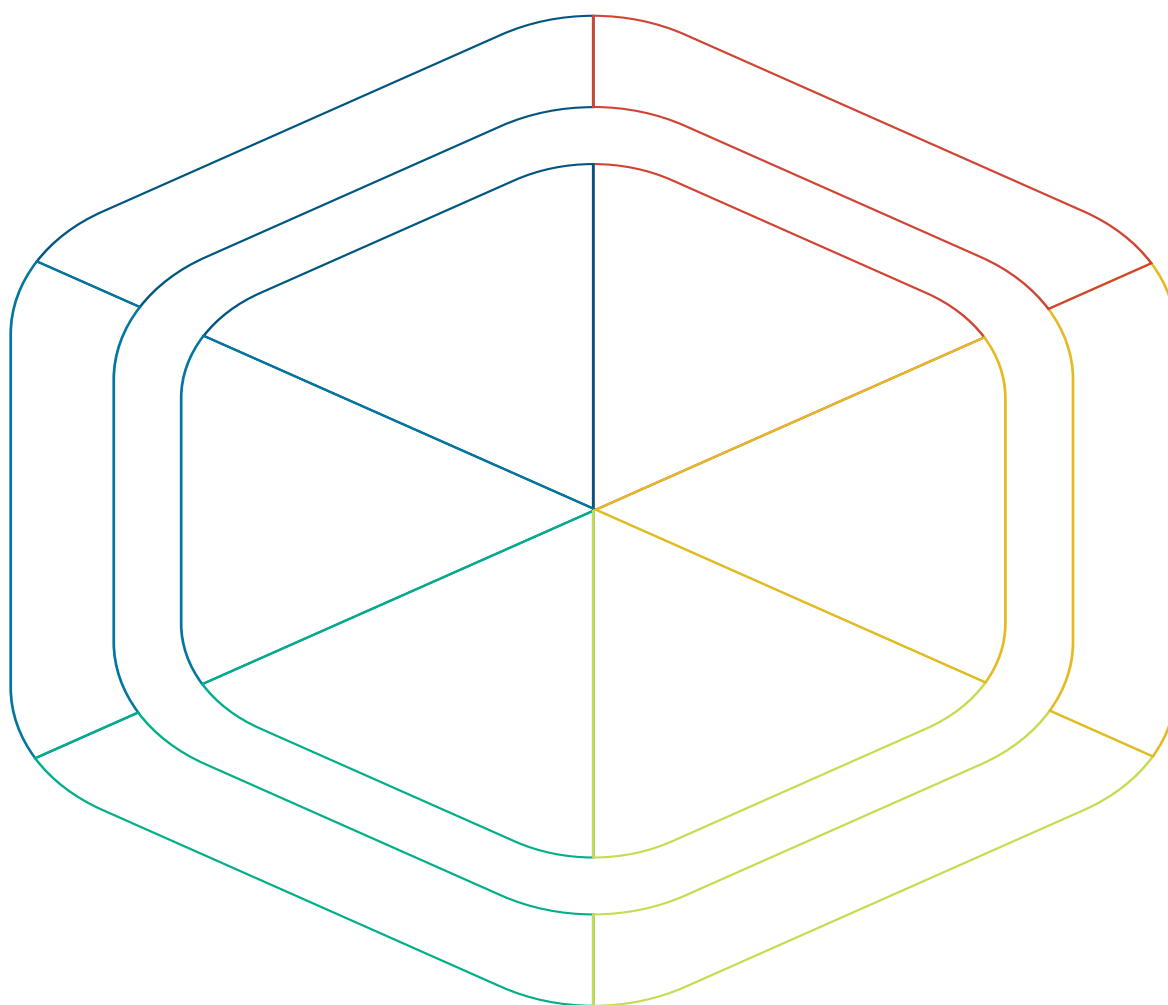
- Policy orientation, as it links data on student learning outcomes with data on students' backgrounds and attitudes towards learning, and on key factors that shape their learning, in and outside of school. This allows highlighting differences in performance and identify the characteristics of students, schools and education systems that perform well;
- Innovative concept of "literacy", which refers to students' capacity to apply knowledge and skills in key subjects, and to analyse, reason and communicate effectively as they identify, interpret and solve problems in a variety of situations;
- Lifelong learning, as students cannot learn everything they need to know in school. In order to be effective lifelong learners, young people need not only knowledge and skills, but also an awareness of why and how they learn. PISA both measures student performance in reading, mathematics and science literacy, and asks students about their motivations, beliefs about themselves and learning strategies.



What are the PISA assessment frameworks?

The PISA frameworks establish the conceptual foundation for what the assessment measures. They focus on students' capacity to analyse, reason and communicate effectively as they pose, solve and interpret problems in a variety of situations. Age 15 is chosen as the target population of PISA because at this age students are approaching the end of compulsory education in most OECD and many non-OECD countries and economies.

The PISA assessment frameworks define competence as far more than the capacity to reproduce accumulated knowledge. According to PISA, competence is the ability to successfully meet complex demands in varied contexts through the mobilisation of psychosocial resources, including knowledge and skills, motivation, attitudes, emotions and other social and behavioural components. Rather than assessing whether students can reproduce what they have learned, PISA measures whether students can extrapolate from what they have learned and apply their competencies in novel situations. Tasks that can be solved through simple memorisation or with pre-set algorithms are those that are also easiest to digitise and automate. These types of skills, therefore, will be less relevant in a modern knowledge-based society and are not the focus of PISA. The PISA-based Test for Schools has been developed based on PISA assessment frameworks, which is one of the reasons why the results of the two instruments are directly comparable.

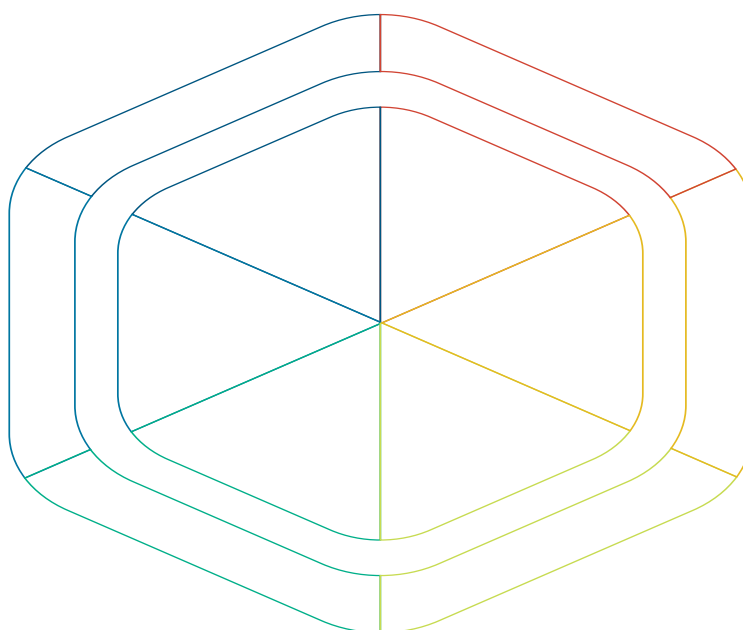


What are PISA scales?

Performances in the three PISA domains of reading, mathematics and science are reported on three scales having an average score of 500 and a standard deviation of 100 across OECD participating countries. PISA scales enable comparisons of average performances in the three main domains for different groups of students and students in other countries. The results of the PISA-based Test for Schools are placed on the same scale as PISA, so that meaningful comparisons can be drawn between participants in the two assessments. Student performance on the PISA scales can be divided into proficiency levels (see **What are PISA proficiency levels?**) that make scores more meaningful with regards to what students are expected to know and be able to do.

It should be noted that performances across domains are not directly comparable. A higher score in mathematics than reading does not necessarily lead to the conclusion that the performance in mathematics was better than the one in reading. In addition, the scores are not cumulative, which implies that it is not possible to produce a final PISA score by summing up the scores of the three domains.

In each round of PISA, one of the three core domains is tested in detail, requiring nearly half of the total testing time. The major domain in 2018 was reading, as it was in 2000 and 2009. Mathematics was the major domain in 2003 and 2012, and science was the major domain in 2006 and 2015. With this alternating schedule of major domains, a thorough analysis of achievement in each of the three core areas is presented every nine years; an analysis of trends is offered every three years. In this way, PISA offers insights for education policy and practice, and monitors trends in students' acquisition of knowledge and skills across countries and in different demographic subgroups within each country.



Reflections on the origins of PISA by Andreas Schleicher, OECD Director of Education and Skills

The transformational idea behind PISA lay in testing the skills of students directly, through a metric that was internationally agreed upon; to link that with data from students, teachers, schools and systems to understand performance differences; and then to harness the power of collaboration to act on the data, both by creating shared points of reference and by leveraging peer pressure. Today, PISA is not only a comparison of countries through representative sample-based tests, but thousands of individual schools have voluntarily joined the PISA for Schools project to see where they stand globally.

We tried to make PISA different from traditional assessments in other ways too. In our view, education is about promoting passion for learning, stimulating the imagination, and developing independent decision makers who can shape the future. So we did not mainly want to reward students for reproducing material they learned in class. To do well in PISA, students had to be able to extrapolate from what they knew, think across the boundaries of subject-matter disciplines, and apply their knowledge creatively in novel situations. If all we do is teach our children what we know, they might remember enough to follow in our footsteps; but if we teach them how to learn, they can go anywhere they want.

Some people argued that our tests were unfair, because we confronted students with problems they had not encountered in school. But then life is unfair, because the real test in life is not whether we can remember what we learned at school yesterday, but whether we will be able to solve problems that we can't possibly anticipate today. The modern world no longer rewards us just for what we know, but for what we can do with what we know.

Soon the idea of PISA attracted the world's best thinkers and mobilised hundreds of educators and scientists from the participating countries to explore what we should expect from students and how we could test that. Today, we would call that crowdsourcing; but whatever you call it, it created the ownership that was critical for success.[...]

Over the years, PISA established itself as an influential force for education reform. The triennial assessment has helped policy makers lower the cost of political action by backing difficult decisions with evidence. But it has also raised the political cost of inaction by exposing areas where policy and practice were unsatisfactory. Two years after that first meeting around a table in Paris, 28 countries signed on to participate. Today, PISA brings together more than 90 countries, representing 80% of the world economy, in a global conversation about education.

Source: Schleicher, A., (OECD 2018), *World Class: How to Build a 21st-Century School System, Strong Performers and Successful Reformers in Education*, [available here](#).

What are PISA proficiency levels?

Student performance on the PISA scales can be divided into proficiency levels that help making scores more meaningful with regards to what students are expected to know and be able to do. Every proficiency level in reading, mathematics and science represents a specific level of student ability based on the tasks that students at this level can complete.

Students who reach the top levels (Levels 5 and 6) are well on their way to becoming the skilled knowledge workers of tomorrow. How successfully schools and education systems can develop students who perform at these levels is particularly relevant when looking at long-term global competitiveness.

Students who perform at the intermediate levels (Levels 2, 3 and 4) are able to demonstrate skills and competencies that will allow them to participate productively in life as they continue their studies and enter the labour force. Level 2 is a particularly important threshold, as PISA considers it the baseline level of proficiency at which students begin to demonstrate the competencies that will enable them to participate effectively and productively as students, workers and citizens.

However, students who perform below baseline Level 2 are at risk of poor educational and labour market outcomes. Detailed descriptions of all proficiency levels for each domain are included below.

Due to the usually small sample sizes of schools participating in the PISA-based Test for Schools, the School Report aggregates the students into three groups: students who reach the top levels (corresponding to PISA Levels 5 and 6) and are well on their way to becoming the highly skilled knowledge workers of tomorrow; students who perform at the intermediate levels (corresponding to PISA Levels 2, 3 and 4) and are able to demonstrate skills and competences that will allow them to participate productively in life as they continue their studies and enter the labour force; and students who perform below baseline PISA Level 2 and who are at risk of poor educational and labour-market outcomes.

What is reading literacy and what are reading proficiency levels?

Reading literacy is understanding, using, evaluating, reflecting on and engaging with texts in order to achieve one's goals, to develop one's knowledge and potential and to participate in society.

Depending on the types of tasks that students successfully complete, students can be grouped into different levels of reading proficiency. Figure 1.1 presents short descriptions of what students are expected to know and be able to do at each proficiency level.

Figure 1.1 Proficiency levels for reading

Level	What students can do at this level of proficiency
6	Readers at Level 6 typically can make multiple inferences, comparisons and contrasts that are both detailed and precise. They demonstrate a full and detailed understanding of one or more texts and may integrate information from more than one text. Tasks may require the reader to deal with unfamiliar ideas in the presence of prominent competing information, and to generate abstract categories for interpretations. Students can hypothesise about or critically evaluate a complex text on an unfamiliar topic, taking into account multiple criteria or perspectives and applying sophisticated understandings from beyond the text. A salient condition for accessing and retrieving tasks at this level is the precision of analysis and fine attention to detail that is inconspicuous in the texts.
5	At Level 5, readers can locate and organise several pieces of deeply embedded information, inferring which information in the text is relevant. Reflective tasks require critical evaluation or hypothesis-making, drawing on specialised knowledge. Both interpreting and reflecting tasks require a full and detailed understanding of a text whose content or form is unfamiliar. For all aspects of reading, tasks at this level typically involve dealing with concepts that are contrary to expectations.
4	At Level 4, readers can locate and organise several pieces of embedded information. They can also interpret the nuances of language in a section of text by taking into account the text as a whole. In other interpreting tasks, students demonstrate understanding and application of categories in an unfamiliar context. In addition, students at this level can use formal or public knowledge to hypothesise about or critically evaluate a text. Readers must demonstrate an accurate understanding of long or complex texts whose content or form may be unfamiliar.
3	Readers at Level 3 can locate, and in some cases recognise the relationship between, several pieces of information that must meet multiple conditions. They can also integrate several parts of a text in order to identify a main idea, understand a relationship or construe the meaning of a word or phrase. They need to take into account many features in comparing, contrasting or categorising. Often the required information is not prominent or there is much competing information; or there are other text obstacles, such as ideas that are contrary to expectations or negatively worded. Reflecting tasks at this level may require connections, comparisons, and explanations, or they may require the reader to evaluate a feature of the text. Some reflecting tasks require readers to demonstrate a fine understanding of the text in relation to familiar, everyday knowledge. Other tasks do not require detailed text comprehension but require the reader to draw on less common knowledge.
2	Readers at Level 2 can locate one or more pieces of information, which may need to be inferred and may need to meet several conditions. They can recognise the main idea in a text, understand relationships, or construe meaning within a limited part of the text when the information is not prominent and the reader must make low-level inferences. Tasks at this level may involve comparisons or contrasts based on a single feature in the text. Typical reflecting tasks at this level require readers to make a comparison or several connections between the text and outside knowledge, by drawing on personal experience and attitudes.
1a	Readers at Level 1a can locate one or more independent pieces of explicitly stated information; they can recognise the main theme or author's purpose in a text about a familiar topic, or make a simple connection between information in the text and common, everyday knowledge. Typically, the required information in the text is prominent and there is little, if any, competing information. The student is explicitly directed to consider relevant factors in the task and in the text.
1b	Readers at Level 1b can locate a single piece of explicitly stated information in a prominent position in a short, syntactically simple text with a familiar context and text type, such as a narrative or a simple list. Texts in Level 1b tasks typically provide support to the reader, such as repetition of information, pictures or familiar symbols. There is minimal competing information. Level 1b readers can interpret texts by making simple connections between adjacent pieces of information.
1c	Although it is possible to measure the reading proficiency of students performing below Level 1b, at this stage their proficiency – what they can do – cannot be described. In developing new material for PISA 2018, items were designed to measure reading skill and understanding located at or below Level 1b.

Source: OECD (2019), PISA 2018 Assessment and Analytical Framework, PISA, OECD Publishing, Paris, <https://doi.org/10.1787/b25efab8-en>

What is mathematics literacy and what are mathematics proficiency levels?

Mathematical literacy is an individual's capacity to formulate, employ and interpret mathematics in a variety of contexts. It includes reasoning mathematically and using mathematical concepts, procedures, facts and tools to describe, explain and predict phenomena. It assists individuals to recognise the role that mathematics plays in the world and to make the well-founded judgements and decisions needed by constructive, engaged and reflective citizens.

Depending on the tasks that students are able to complete successfully, students can be grouped into different levels of mathematics proficiency. Figure 1.2 presents short descriptions of what students are expected to know and be able to do at each level of mathematics proficiency.

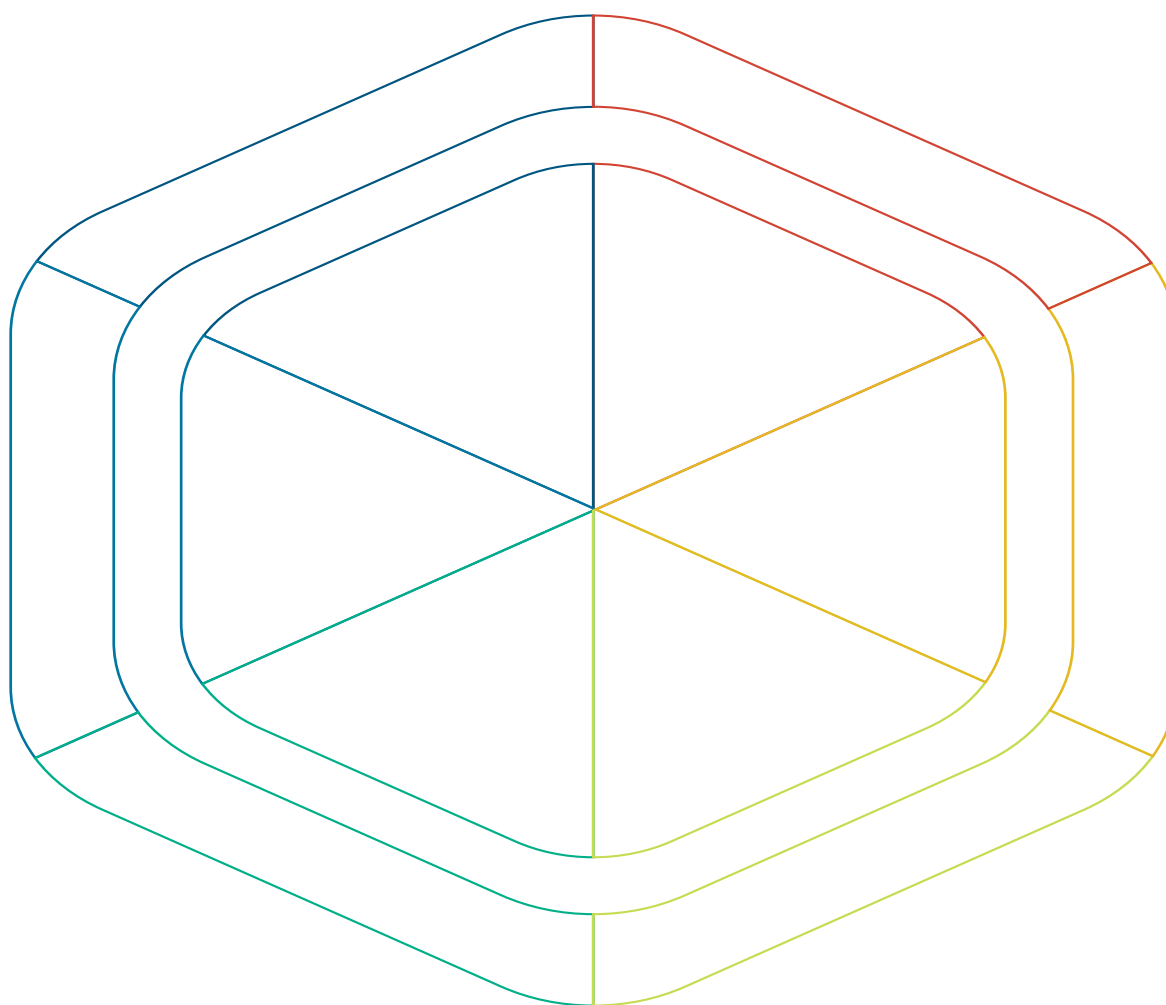


Figure 1.2 Proficiency levels for mathematics

Level	What students can do at this level of proficiency
6	At Level 6, students can conceptualise, generalise and utilise information based on their investigations and modelling of complex problem situations, and can use their knowledge in relatively non-standard contexts. They can link different information sources and representations and flexibly translate among them. Students at this level are capable of advanced mathematical thinking and reasoning. These students can apply this insight and understanding, along with a mastery of symbolic and formal mathematical operations and relationships, to develop new approaches and strategies for attacking novel situations. Students at this level can reflect on their actions, and can formulate and precisely communicate their actions and reflections regarding their findings, interpretations, arguments, and the appropriateness of these to the original situation.
5	At Level 5, students can develop and work with models for complex situations, identifying constraints and specifying assumptions. They can select, compare and evaluate appropriate problem-solving strategies for dealing with complex problems related to these models. Students at this level can work strategically using broad, well-developed thinking and reasoning skills, appropriate linked representations, symbolic and formal characterisations, and insight pertaining to these situations. They begin to reflect on their work and can formulate and communicate their interpretations and reasoning.
4	At Level 4, students can work effectively with explicit models for complex concrete situations that may involve constraints or call for making assumptions. They can select and integrate different representations, including symbolic, linking them directly to aspects of real-world situations. Students at this level can utilise their limited range of skills and can reason with some insight, in straightforward contexts. They can construct and communicate explanations and arguments based on their interpretations, arguments and actions.
3	At Level 3, students can execute clearly described procedures, including those that require sequential decisions. Their interpretations are sufficiently sound to be a base for building a simple model or for selecting and applying simple problem-solving strategies. Students at this level can interpret and use representations based on different information sources and reason directly from them. They typically show some ability to handle percentages, fractions and decimal numbers, and to work with proportional relationships. Their solutions reflect that they have engaged in basic interpretation and reasoning.
2	At Level 2, students can interpret and recognise situations in contexts that require no more than direct inference. They can extract relevant information from a single source and make use of a single representational mode. Students at this level can employ basic algorithms, formulae, procedures or conventions to solve problems involving whole numbers. They are capable of making literal interpretations of the results.
1	At Level 1, students can answer questions involving familiar contexts where all relevant information is present and the questions are clearly defined. They are able to identify information and to carry out routine procedures according to direct instructions in explicit situations. They can perform actions that are almost always obvious and follow immediately from the given stimuli.

Source: OECD (2013), PISA 2012 Assessment and Analytical Framework: Mathematics, Reading, Science, Problem Solving and Financial Literacy, PISA, OECD Publishing, Paris, <https://dx.doi.org/10.1787/9789264190511-en>

What is science literacy and what are science proficiency levels?

Scientific literacy is the ability to engage with science-related issues, and with the ideas of science, as a reflective citizen. A scientifically literate person is willing to engage in reasoned discourse about science and technology, which requires the competencies to: explain phenomena scientifically, evaluate and design scientific enquiry, and interpret data and evidence scientifically.

As with reading and mathematics, depending on the science tasks that they can successfully complete, students can be grouped into different levels of science proficiency. Figure 1.3 presents short descriptions of what students are expected to know and be able to do at each level of science proficiency.

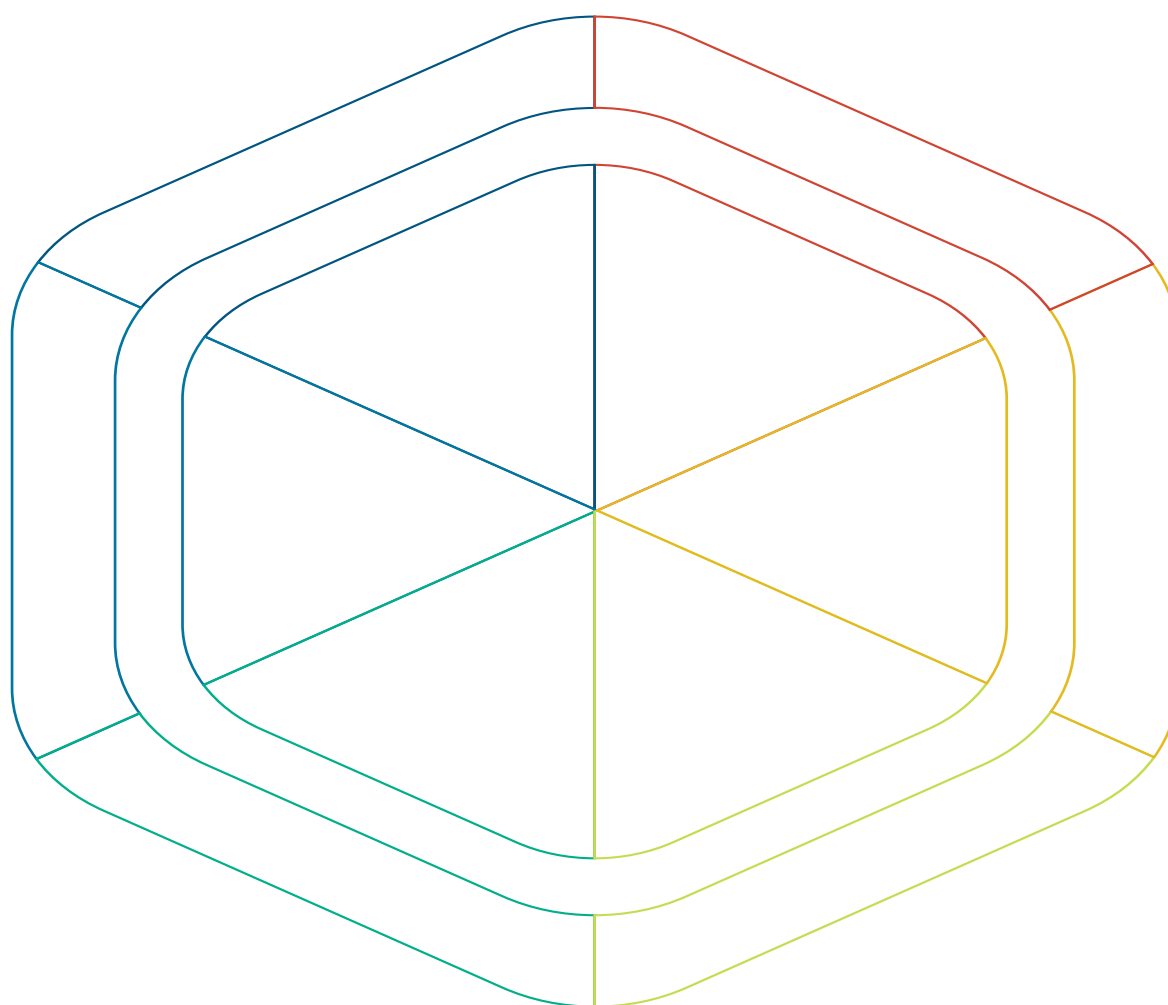


Figure 1.3 Proficiency levels for science

Level	What students can do at this level of proficiency
6	At Level 6, students can draw on a range of interrelated scientific ideas and concepts from the physical, life and earth and space sciences and use content, procedural and epistemic knowledge in order to offer explanatory hypotheses of novel scientific phenomena, events and processes or to make predictions. In interpreting data and evidence, they are able to discriminate between relevant and irrelevant information and can draw on knowledge external to the normal school curriculum. They can distinguish between arguments that are based on scientific evidence and theory and those based on other considerations. Level 6 students can evaluate competing designs of complex experiments, field studies or simulations and justify their choices.
5	At Level 5, students can use abstract scientific ideas or concepts to explain unfamiliar and more complex phenomena, events and processes involving multiple causal links. They are able to apply more sophisticated epistemic knowledge to evaluate alternative experimental designs and justify their choices and use theoretical knowledge to interpret information or make predictions. Level 5 students can evaluate ways of exploring a given question scientifically and identify limitations in interpretations of data sets including sources and the effects of uncertainty in scientific data.
4	At Level 4, students can use more complex or more abstract content knowledge, which is either provided or recalled, to construct explanations of more complex or less familiar events and processes. They can conduct experiments involving two or more independent variables in a constrained context. They are able to justify an experimental design, drawing on elements of procedural and epistemic knowledge. Level 4 students can interpret data drawn from a moderately complex data set or less familiar context, draw appropriate conclusions that go beyond the data and provide justifications for their choices.
3	At Level 3, students can draw upon moderately complex content knowledge to identify or construct explanations of familiar phenomena. In less familiar or more complex situations, they can construct explanations with relevant cueing or support. They can draw on elements of procedural or epistemic knowledge to carry out a simple experiment in a constrained context. Level 3 students are able to distinguish between scientific and non-scientific issues and identify the evidence supporting a scientific claim.
2	At Level 2, students are able to draw on everyday content knowledge and basic procedural knowledge to identify an appropriate scientific explanation, interpret data, and identify the question being addressed in a simple experimental design. They can use basic or everyday scientific knowledge to identify a valid conclusion from a simple data set. Level 2 students demonstrate basic epistemic knowledge by being able to identify questions that can be investigated scientifically.
1a	At Level 1a, students are able to use basic or everyday content and procedural knowledge to recognise or identify explanations of simple scientific phenomenon. With support, they can undertake structured scientific enquiries with no more than two variables. They are able to identify simple causal or correlational relationships and interpret graphical and visual data that require a low level of cognitive demand. Level 1a students can select the best scientific explanation for given data in familiar personal, local and global contexts.
1b	At Level 1b, students can use basic or everyday scientific knowledge to recognise aspects of familiar or simple phenomenon. They are able to identify simple patterns in data, recognise basic scientific terms and follow explicit instructions to carry out a scientific procedure.

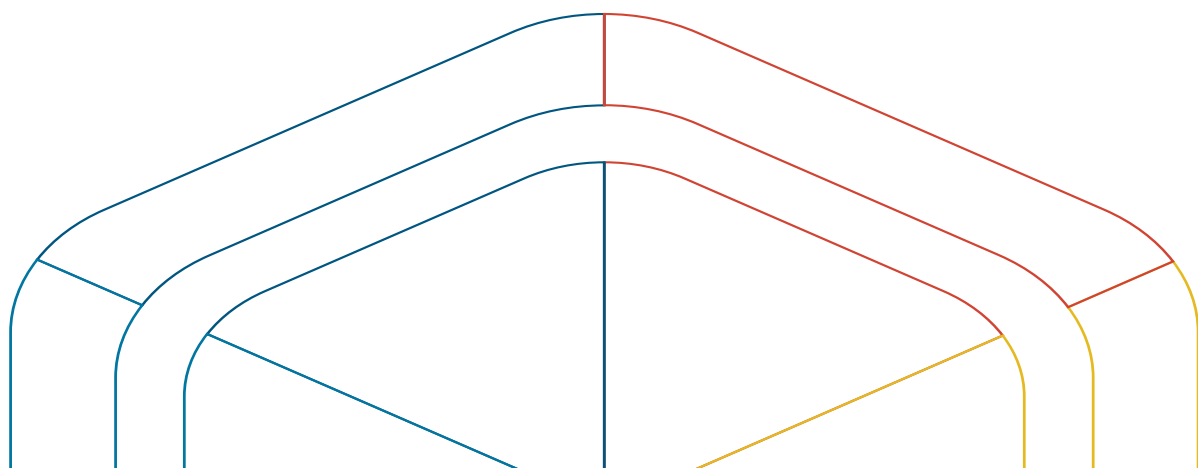
Source: OECD (2016), PISA 2015 Results (Volume I): Excellence and Equity in Education, PISA, OECD Publishing, Paris, <http://dx.doi.org/10.1787/9789264266490-en>.

What is the PISA index of economic, social and cultural status (ESCS)?

Socio-economic status is a broad concept that summarises many different aspects of a student, school or school system. In PISA and in the PISA-based Test for Schools, the student's socio-economic status is estimated by the PISA index of economic, social and cultural status (ESCS). This index is derived from several variables related to the students' family background: parents' education, parents' occupation, a number of home possessions that can be taken as proxies for material wealth, and the number of books and other educational resources available in their home. The index scores are scaled such that the OECD average is 0.0. A value of one represents one standard deviation away from the average.

What is the PISA index of disciplinary climate?

The PISA index of disciplinary climate is an index based on students' responses to questions about how frequently the following things happen during their lessons: "Students don't listen to what the teacher says"; "There is noise and disorder"; "The teacher has to wait a long time for students to quiet down"; "Students cannot work well"; and "Students don't start working for a long time after the lesson begins". These statements are combined to create the index of disciplinary climate whose average is zero and whose standard deviation is one across OECD countries. The index scores are scaled such that the OECD average is 0.0. A value of one represents one standard deviation away from the average. In the School Report, this index is used to investigate the relationship between the school environment and students' social and emotional skills.





3. WHAT IS PISA FOR SCHOOLS?

What is PISA for Schools?

PISA for Schools is an OECD project that aims to improve student learning opportunities and well-being by empowering teachers and school leaders through global connections and international benchmarking. The project has two main goals:

- To provide schools with the PISA-based Test for Schools, which allows collecting data on the students' abilities in reading, mathematics and science; teacher-student relations; disciplinary climate in school; and students' attitudes, engagement towards learning and social and emotional skills. As of April 2020, more than 5500 schools in 10 countries have taken part in the PBTS.
- To develop opportunities for global peer learning on improving learning outcomes, which is achieved by designing a series of post-assessment activities with the aim to support educators in implementing evidence-based improvement measures at school. The activities include an online forum dedicated to PISA for Schools participants (the PISA for Schools Community, available at <https://oecdписаforschools.org>) and a network of international ambassadors providing support for carrying out improvement plans.

What is the PISA-based Test for Schools?

The PBTS is the instrument used by the OECD PISA for Schools project to provide schools with an international benchmarking based on a common scale provided by PISA.

The PBTS is a voluntary assessment intended to help school leaders from across the world understand their 15-year-old students' abilities to think critically and apply their knowledge creatively in novel contexts. In the PBTS, eligible students from participating schools are sampled and then sit a computer-based assessment (as of 2020). In the assessment, they are presented with stimuli, such as texts, diagrams, tables and/or graphs, that are followed by questions about them. The questions are constructed such that required tasks closely resemble what students might encounter in everyday life. Overall, the PBTS consists of 141 items: 47 questions in reading, 40 in mathematics and 54 in science. A typical student would need almost 5 hours – without breaks – to answer all questions. As this is clearly not possible, the questions are grouped into seven booklets, such that different students answer overlapping groups of questions. In fact, each student is given 120 minutes of testing time to complete one of the seven booklets that has randomly been assigned to her. Thus, students in each school are tested in a wide range of topics while limiting testing time, and each booklet provides students with a test experience similar to PISA.

Apart from the cognitive test items, the PBTS includes two contextual questionnaires. Every student who participates in the assessment completes a questionnaire including questions about the student's family and home, their learning strategies, attitudes and dispositions toward learning, and school's climate. Another questionnaire is completed by the principal, or substitute, and collects information about the structure and organisation of the school, students' demographics, and school's resources. Figure 1.4 summarises some of the most relevant features of the PBTS implementation.

What is the difference between PISA and the PISA-based Test for Schools?

The OECD created the original PISA assessment in response to its member countries' demands for regular and reliable data on the knowledge and skills of their students and the performance of their education systems in an international context. While the PISA assessment is intended to provide aggregate national results for international comparisons and to inform policy discussions, the PISA-based Test for Schools (PBTS) is designed to provide school-level results for benchmarking and school-improvement purposes.

Figure 1.4 Main implementation characteristics of the PBTS

Target population	Like in PISA, the target population consists of all students who are between 15 years and 3 completed months to 16 years and 2 completed months at the time of assessment and who are enrolled in an educational institution at grade 7 or higher.
Eligible schools	<p>All schools with students that fall within the target population are eligible to participate in the PBTS if they meet the minimum requirements:</p> <ul style="list-style-type: none"> • Each school must have 42 or more eligible students; • In addition, 80% or more of the sampled students must provide valid responses to the assessment to be able to produce a school report (see the PBTS 2020 Technical Report for a comprehensive definition of “valid responses”). <p>To ensure that the minimum number of 42 students per school is reached, schools are encouraged to test at least 55 students.</p>
School sampling	<p>All eligible schools that wish to participate in the PBTS can do so by contacting the country’s National Service Provider (NSP), which is the organisation delivering the PBTS – on behalf of the OECD – in each country. Hence, most of school populations participating in the PBTS represent self-selected populations, and therefore cannot be assumed to be representative samples of a country or of a region.</p> <p>In some circumstances, though, regional and municipal authorities have requested to have representative samples of their school population. The PBTS can also be used with this purpose by following a sampling method based on the random selection of the schools from a complete sample frame (the amount of schools to be selected will vary depending on the size of the sample frame).</p>
Student sampling	Once the NSP has compiled the full list of schools that participate in the PBTS and the list of all the students representing the target population for each school, random sampling is used to select the students (unless schools decide to test all of their eligible students).
Validation study (Field trial)	<p>The validation study (field trial) is a mandatory element of the assessment process. It ensures the psychometric properties of the instruments in the context of the country of administration. The schools selected for participating in the field trial should be as diverse as possible in terms of level of achievement, school size, intake and type. The schools participating in the field trial receive a standard school report if they meet the minimum requirements. Once the field trial is completed, the PBTS is ready for adoption by any school in the country.</p>
Testing dates	The NSPs can choose the testing period when they wish to administer the PBTS. Testing should be avoided during the assessment period of other OECD tests, such as PISA and TALIS.
Administration mode	To ensure alignment with PISA, the PBTS is available in digital and multilingual formats. The administration of the PBTS can take place both online and offline.
Test format	The PBTS consists of a two-hour-long cognitive test covering reading, mathematics and science and of a thirty-minute background questionnaire (see page 22 for additional details).

Why test 15-year-olds?

Like PISA, the PBTS is designed for students who are between 15 years and 3 completed months to 16 years and 2 completed months at the time of assessment. The age of 15 was chosen because at this age young people in most OECD countries are nearing the end of compulsory education.

How do PISA and the PBTS ensure the comparability of questions across countries and languages?

The value of cross-country comparisons is at the heart of large-scale international surveys such as PISA and the PBTS. Both of them follow several standards and procedures concerned with ensuring fair and valid comparisons of results across countries. These include consistent implementation and, for PISA, the use of representative samples in each participating country and economy. Much effort also goes into ensuring that the questions used maintain their measurement properties in each of the many language versions. The steps to ensure that the resulting measures are equivalent include:

- Qualitative reviews of all test and questionnaire items, at different stages of their development, by national and international experts in the respective domains. The ratings and comments submitted by national experts determine the revision of items and coding guides for the main study, and guide the final selection of questions.
- Prescribed procedures for translation and adaptation. These include the preparation of two source versions (English and French for PISA, and English only for the PBTS), of detailed translation and adaptation guidelines, the requirement of a double-translation design (two independent translations are reconciled by a third person in the case of PISA), and a final quality control of the resulting translation (“verification”), performed by an independent verification centre. Countries sharing a test language are encouraged to develop a common version that is then adapted to national contexts. Translation and adaptation procedures are described in the [PISA 2018 Technical Report](#) for PISA, and in the PISA for Schools Translation and Adaptation Guidelines for the PBTS. The latter is provided directly by the OECD to National Service Providers (NSPs), which are the organisations delivering the PBTS – on behalf of the OECD – in each country.
- For test and questionnaire scales relying on multiple questions, systematic analysis of measurement equivalence through statistical indicators of scale consistency and model fit. These analyses are documented in the [PISA 2018 Technical Report](#) and the [PBTS 2020 Technical Report](#). The comparability of scale values is supported by a large number of items, whose model parameters could be constrained to the same values and that can therefore serve as “anchors” on the reporting scale.

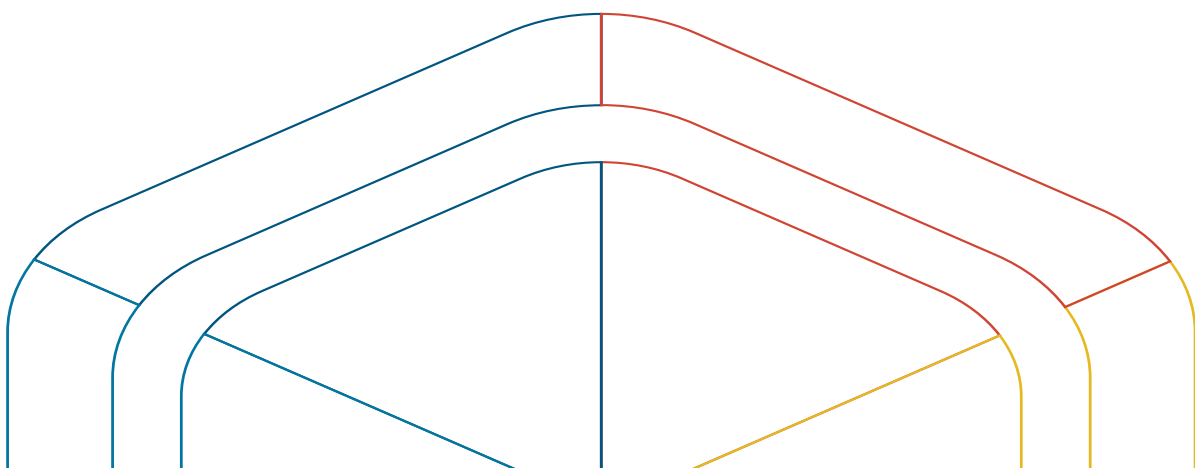
What types of test items are used in the PBTS and why?

The PBTS follows the internationally recognised assessment frameworks used in PISA, and the design blueprints for the test. Its questions mirror the questions used in PISA with regard to *aspect*, *text format* and *text type* variables for reading; *process*, *content* and *context* variables for mathematics items; and *competency*, *knowledge about* and *knowledge of science* variables. These features contribute to ensuring direct comparability between PBTS and PISA results. The frameworks used in PISA were developed by international experts and are updated continuously to reflect subject matter developments and progress in assessment methods. These frameworks are based on the concept of literacy, which includes student capacity to extrapolate from what they have learned and apply their knowledge and skills in real-life settings, as well as their capacity to analyse, reason and communicate effectively as they pose, interpret and solve problems in a variety of situations.

Both the PBTS and PISA use multiple-choice testing as the primary feature of assessment because it is reliable, efficient, and supports robust and scientific analyses. Multiple-choice questions have a variety of formats, including highlighting of a word within a text, connecting pieces of information and making multiple selections from drop-down menus. In addition, typically up to one-third of questions are open-ended. Students also answer a background questionnaire, providing information about themselves, their attitudes to learning and their homes. If requested, National Service Providers (NSPs) can also include a few meaningful additional questions to the student questionnaire. In addition, many NSPs choose to gather further information through administrative data.

For the development of the PBTS, item response types were also a design factor during the development of the test. The goal was to mirror as closely as possible the distribution of response types of the main PISA study. One important aspect of the final assessment items of the PBTS is that all three domains are equally represented in terms of testing time (approximately 92 minutes per subject domain), which is the PISA standard for minor domains in every cycle.

Like PISA, the PBTS is developed around units. A unit consists of stimulus material, including texts, diagrams, tables and/or graphs, and is then followed by one or more questions about it. The questions are constructed to mirror as close as possible the tasks that students might come across in the real world. All PBTS questions are reviewed by international contractors and by participating countries and economies, and are carefully checked for cultural bias.



Why don't all students answer all the same test questions?

Both the PBTS and PISA are designed to provide an assessment of performance at the system level (be it the country or the school, respectively). They are not designed to produce scores for individual students, so it is not necessary for each student to receive exactly the same set of test items. Thus, both tests adopt an efficient test design in which the full set of material, covering all aspects of the framework, is distributed over a number of test forms. This procedure enables the OECD to obtain a much greater coverage of the content than if all students had completed the same version of the test.

What scale is used for the test scores?

PISA scores – and hence PBTS scores – can be located along specific scales developed for each subject area, designed to show the general competencies tested by PISA. These scales are divided into levels that represent groups of test questions, beginning with questions that require only the most basic skills to complete and increasing in difficulty with each level (see **What are PISA proficiency levels?**). Once student responses to the test have been scored, their overall score in reading, mathematics and science can be located on the appropriate scale.

In each subject, there is theoretically no minimum or maximum score; rather, the results are scaled to fit approximately normal distributions, with averages for OECD countries around 500 score points and standard deviations around 100 score points.

Now that the PBTS is delivered as a computer-based test, how has the link with PISA been maintained?

Over the past decades, digital technologies have fundamentally transformed the ways we read and manage information. Digital technologies are also transforming teaching and learning, and how schools assess students. To reflect how students and societies now commonly access, use and communicate information, PISA and the PBTS are now delivered digitally in almost all of their participating countries.

An international linking study was conducted between August 2019 and January 2020 in Spain, the United States, Brazil and the Russian Federation in order to align the PBTS item parameters to the PISA international scale. The international linking study was subject to external review and designed to ensure that the digital version of the PBTS maintains a strong link to PISA, which has been a computer-based assessment since 2015.

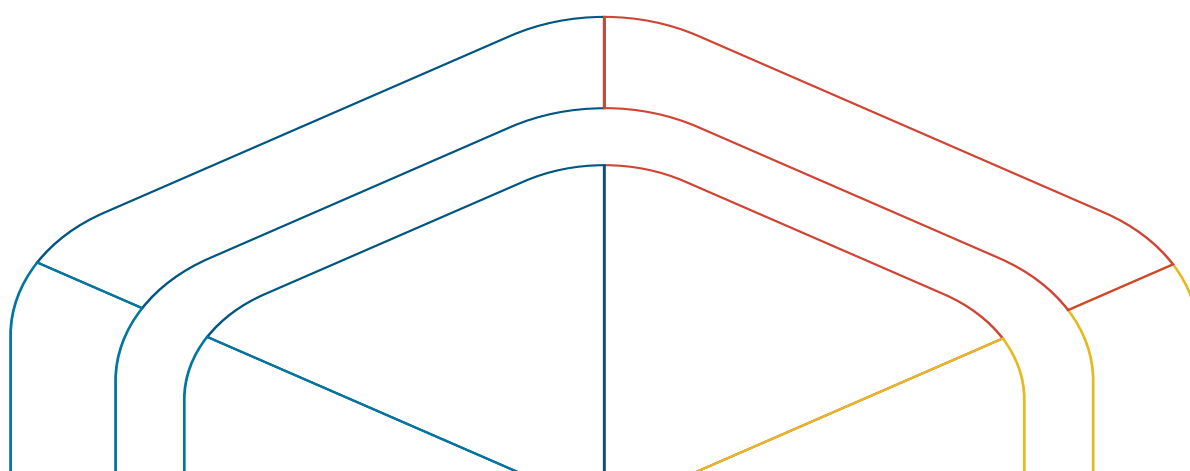
What steps are taken to ensure the tests and the results are robust?

Confidence in the robustness of PISA and the PBTS is based on the rigour that is applied to all technical aspects of the survey design, implementation and analysis. Specifically regarding test development, the robustness of the assessment lies in the rigour of the procedures used in item development, field trials, analysis, review and selection. The details of the test design and development processes are available in the [PISA 2018 Technical Report](#) and the [PBTS 2020 Technical Report](#). Technical reports for earlier assessments are also available.

What steps are taken to prevent cheating?

The OECD applies strict conditions at all levels to make sure that student data accurately reflect students' ability and performance, and do not involve any form of cheating. This assurance starts with the Agreement for Participation between the OECD and each country or National Service Provider. The agreement requires countries to comply with the comprehensive Technical Standards for PISA, including the secure management of test materials and secure administration of the assessment. Furthermore, trained proctors are in charge of invigilating the students while these are taking the test. These requirements are then reinforced through additional manuals for operations, school co-ordinators and test administrators. These manuals have explicit instructions for the secure receipt, handling and storage of all test-related materials, and for the secure administration of the test itself. No one other than approved project staff has access to secure PISA and PBTS data, and embargoed material and formal confidentiality arrangements are in place for all approved project staff.

Adherence to the standards is monitored throughout all project-implementation phases, and all deviations (e.g. deviations from the agreed test-administration protocol), both minor and major, are recorded for further review. After students sit the assessment, each national dataset is reviewed and any inconsistencies flagged for further analysis.

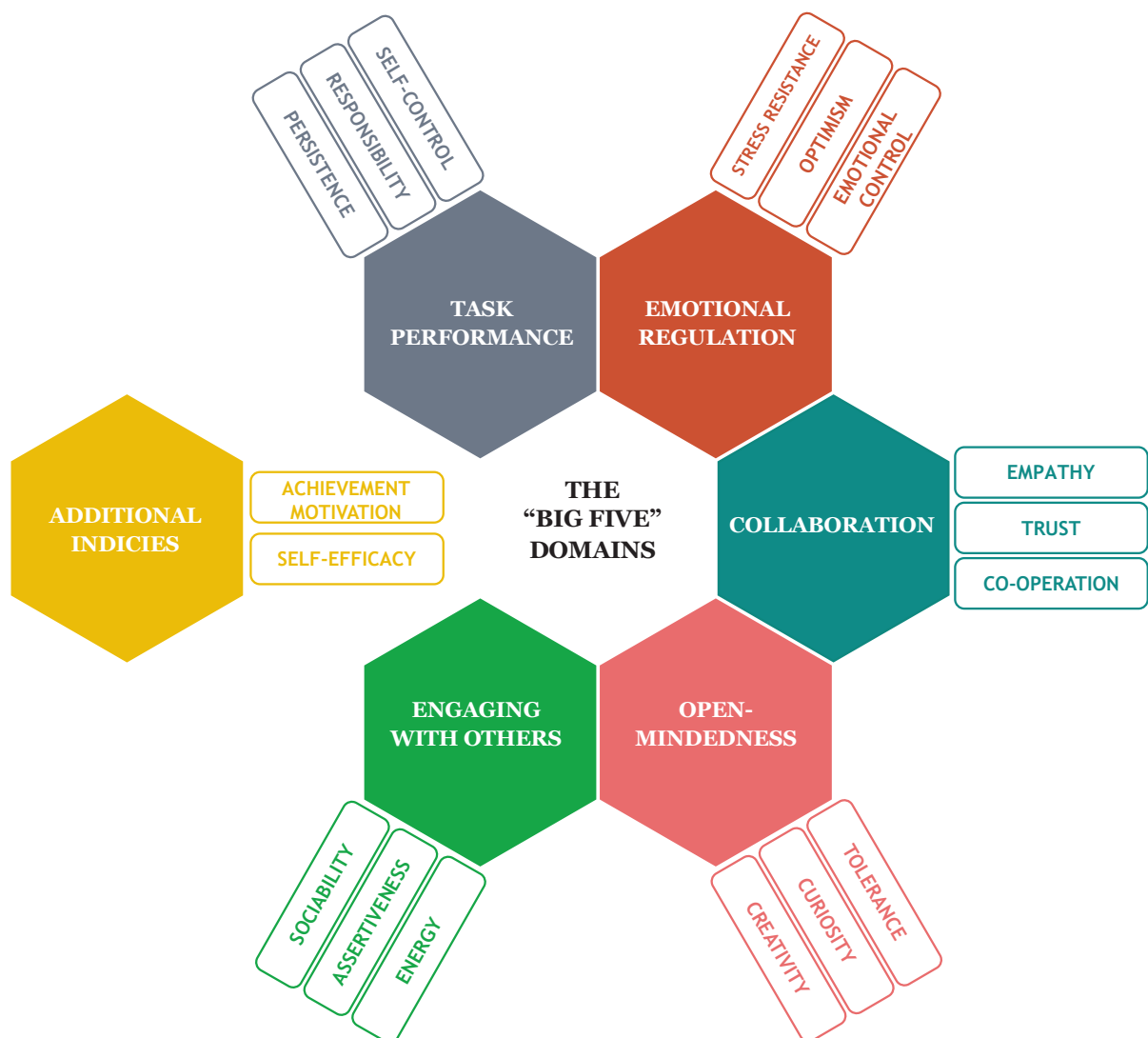


What are social and emotional skills?

Research shows that both cognitive and social and emotional skills improve life outcomes at a societal and an individual level. As of 2016, the OECD launched its Study on Social and Emotional Skills, that aims to assess these skills by drawing on a well-known framework in the field of social and emotional skills – the Big Five model.

As Figure 1.5 shows, the Study evaluates a broad and balanced set of 15 skills from five domains, namely: task performance, emotional regulation, collaboration, open-mindedness and engaging with others.

Figure 1.5 Big Five Model



Source: OECD (2020), OECD Study on Social and Emotional Skills, <http://www.oecd.org/education/ceri/social-emotional-skills-study/about/>

In order to keep the student questionnaire as short as possible, the PBTS includes one skill for each of the five sub-domains, for a total of 40 items. Figure 1.6 describes in details each of the domain and provides readers with an example for each of them.

Figure 1.6 Description of the social and emotional skills included in the PBTS

Big Five domain	Skill measured in the PBTS	Description	Behaviour examples
Open-mindedness (openness to experience)	Curiosity	Interest in ideas and love of learning, understanding and intellectual exploration, an inquisitive mind-set	Likes to read books, to travel to new destinations. Opposite: dislikes change, is not interested in exploring new products.
Task performance	Self-control	Able to avoid distractions and sudden impulses; focus attention on the current task in order to achieve personal goals.	Postpones fun activities until important tasks are completed, does not rush into things. Opposite: is prone to say things before thinking them through.
Engaging with others (extraversion)	Assertiveness	Able to confidently voice opinions, needs, and feelings; exert social influence.	Takes charge in a class or team. Opposite: waits for others to lead the way, keeps quiet when disagrees with others.
Collaboration (agreeableness)	Empathy	Understanding and caring for others and their well-being; values and invests in close relationships.	Consoles a friend who is upset, sympathises with the homeless. Opposite: tends to misinterpret, ignore or disregard other people's feelings.
Emotion regulation (emotional stability)	Optimism	Positive and optimistic expectations for one's self and life in general.	Generally in a good mood. Opposite: often feels sad, tends to feel insecure or unworthy.



4. HOW TO READ THE SCHOOL REPORT?

This section will show you how to interpret **the different types** of figures that appear in the School Report.

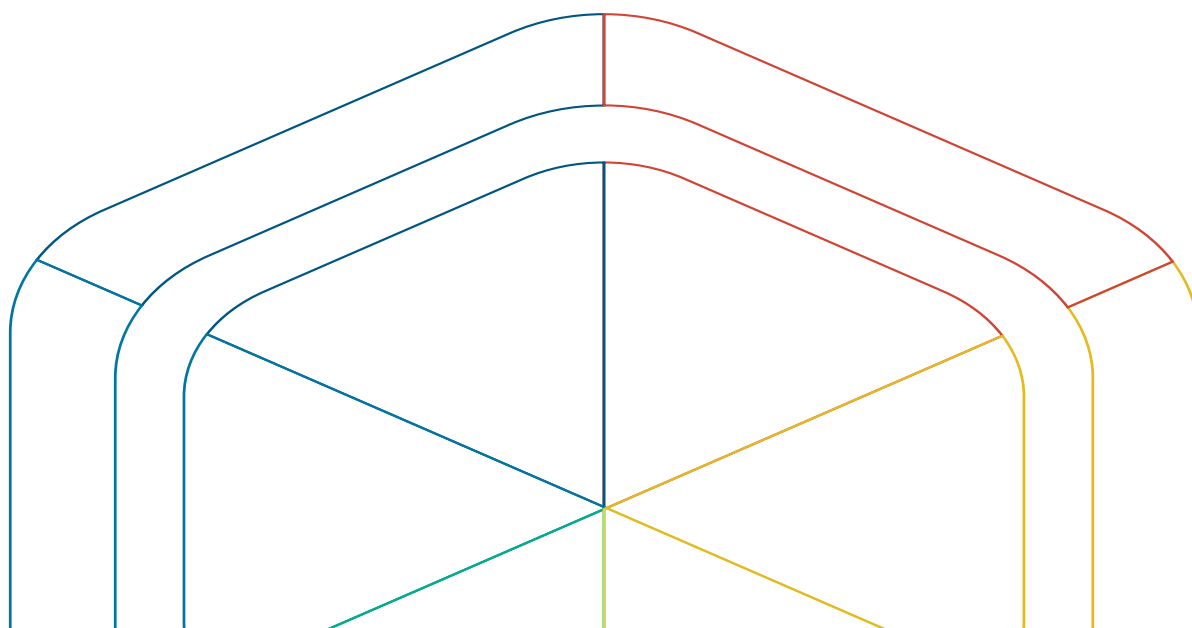


Figure 3.1 of the School Report: Student performance in reading, mathematics and science

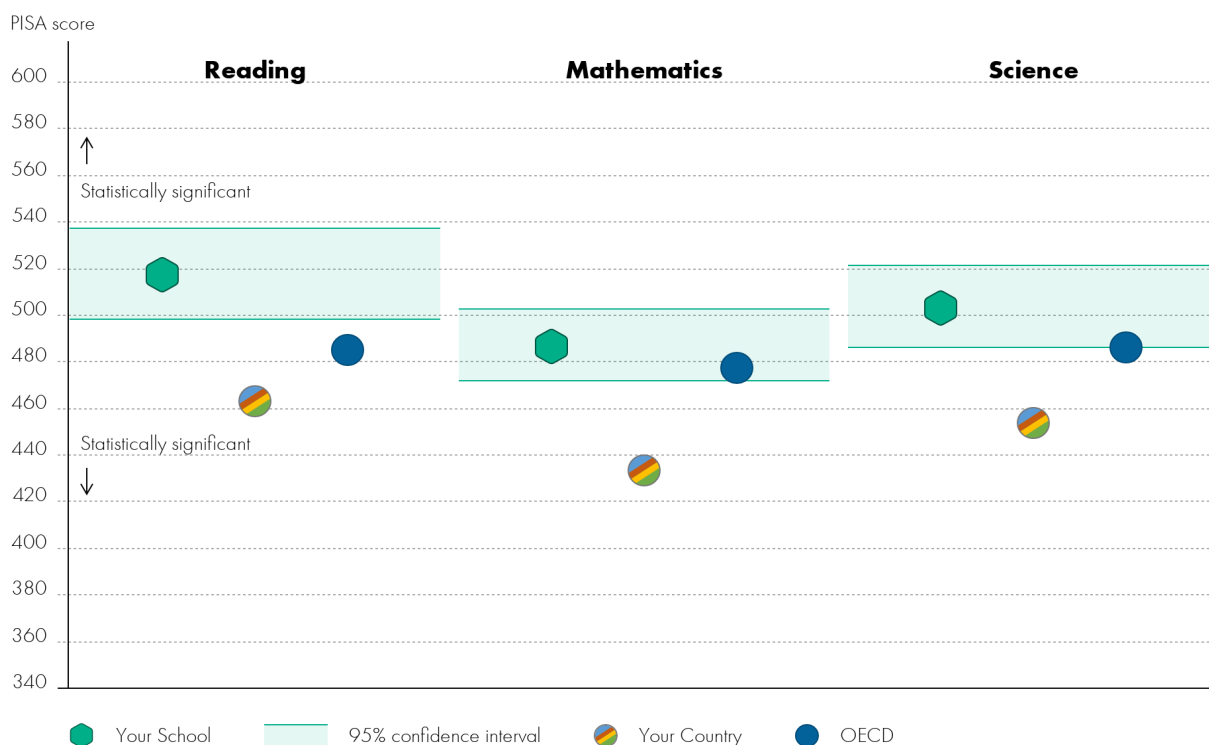


Figure 3.1 of the School Report shows the average performance of Your School in reading, mathematics and science, in relation to the PISA 2018 averages for Your Country and the OECD.

Under each domain, you can see three markers. The green hexagon represents the average PISA score of Your School. The country flag represents the PISA 2018 score of Your Country. The blue circle represents the average performance of all OECD countries in PISA 2018.

The semi-transparent green stripe, with a caption “95% confidence interval”, indicates the extent to which the difference between the performance of Your School and Your Country, or OECD countries, is significantly different or not. If the country flag or the blue circle are situated outside the green stripe, it can be concluded that the performance of Your School is significantly different from that of Your Country or of the OECD. For more information on confidence intervals, please refer to page 48.

It should be noted that performances across domains are not directly comparable. If Your School’s score is higher in mathematics than it is in reading, this does not necessarily lead to the conclusion that Your School performed better in mathematics than in reading. In addition, the scores are not cumulative, which that it is not possible to produce a final PISA score by summing up the score of each domain.

Figure 3.5 of the School Report: Student proficiency levels in reading, mathematics and science

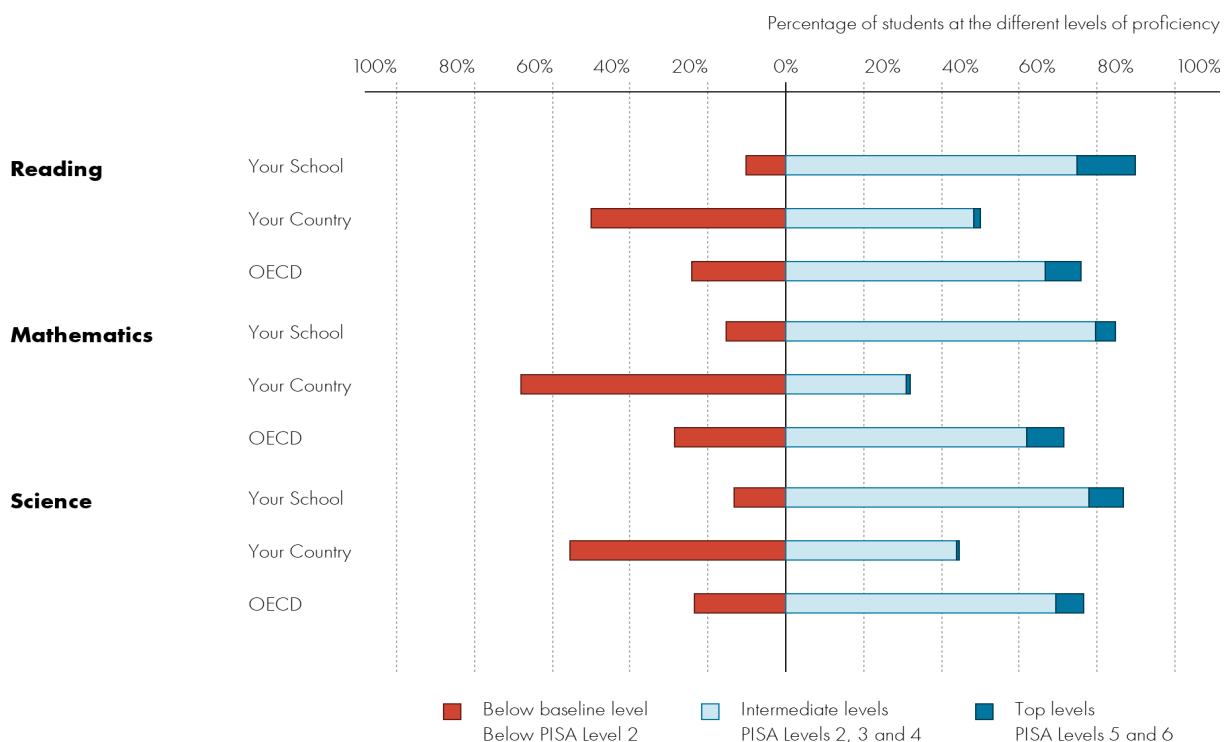


Figure 3.5 of the School Report examines the distribution of student performance within the framework of PISA proficiency levels in Your School, in Your Country and in the OECD. The data for Your Country and the OECD are sourced from PISA 2018.

The figure shows a dark vertical line at the 0% value of the x-axis, so that the percentage of students below baseline level (Level 2) – represented by the red bars – is found on the left-hand side of the line. Conversely, the percentage of students at Levels 2, 3 and 4 – represented by light blue bars – as well as the percentage of students at Levels 5 and 6 – shown in dark blue bars – appear on the right-hand side.

Detailed descriptions of what students are expected to know and be able to do at each proficiency level can be found in Figure 1.1 for reading, Figure 1.2 for mathematics and Figure 1.3 for science.

Figure 3.6 of the School Report: Student performance in reading, mathematics and science for girls and boys

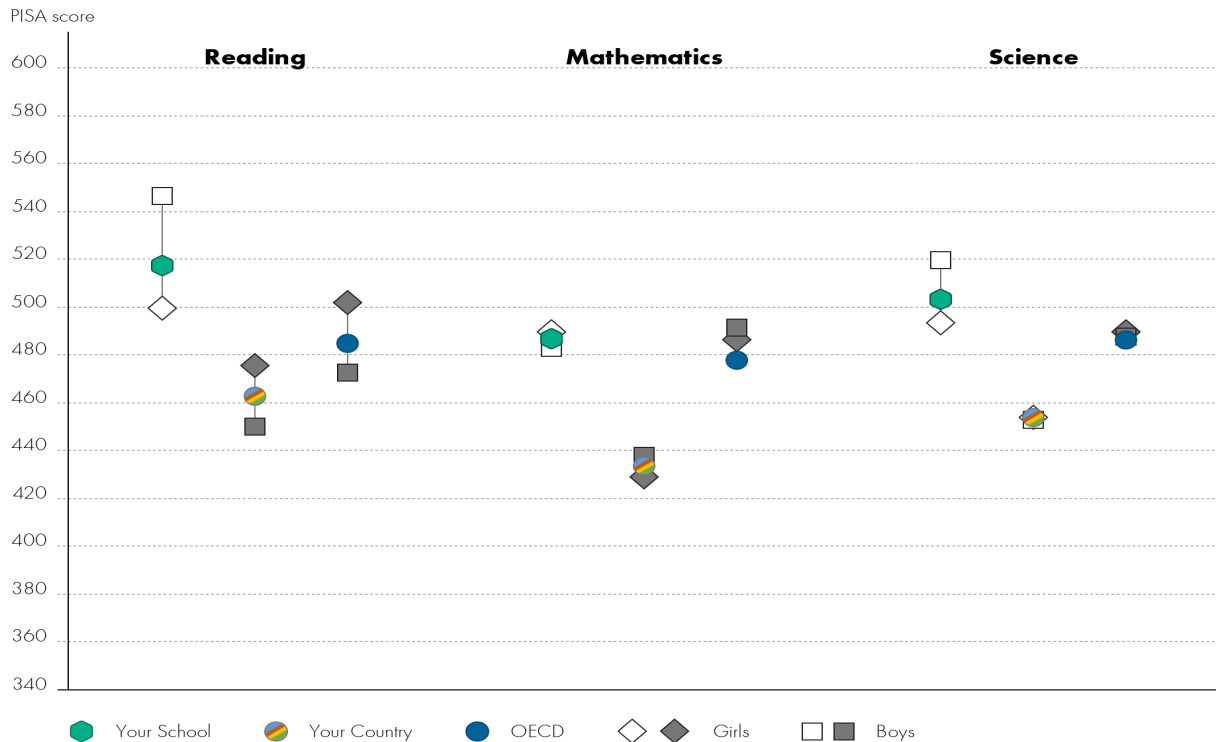


Figure 3.6 of the School Report shows the average performance of Your School in reading, mathematics and science, in relation to the PISA 2018 averages for Your Country and the OECD. Furthermore, the figure also shows the average performance of girls and boys in each case.

Under each domain, you can see several markers. As in Figure 3.1 of the School Report, the green hexagon represents the average performance of Your School. The flag represents the PISA 2018 score of Your Country. The blue circle shows the average performance of all OECD countries in PISA 2018. For each of these three groups, the average performance of girls and boys are represented with a square and a tilted square, respectively.

Furthermore, if the square and the tilted square are filled, this indicates that the difference between the performance of girls and boys in a group is significantly different.

Note about Figures 3.6, 3.7 and 3.8 of the School Report

In the School Report, most results related to countries and economies are reported as within-country results. For example, if a result refers to the scores of the top and bottom 25% of students from a country in terms of socio-economic status, then the result is referring to the scores of the quarter of students within the country who are the most advantaged and the scores of the quarter who are the least advantaged. While this is a useful measure, it may overlook some schools. In most countries and economies, students do not enrol in schools randomly. Instead, they are sorted based upon proximity, ability or preferences. Therefore, a within-country result is likely to over-represent students from some schools and under-represent students from others (e.g. the most advantaged 25% of students in a country or economy may only come from 10% of the schools).

An alternative method is to compare within-schools results from countries and economies. Unlike a within-country result, a within-schools result is a “mean of means” that represents all schools in a country or economy. For example, the scores of the top and bottom 25% of students within-schools in terms of socio-economic status are produced by first calculating the average score of the top and bottom 25% of students in terms of socio-economic status in each school in a country or economy, using weights that make all schools contribute equally to the average. These average scores from each school are then combined to produce the average score within-schools of the top and bottom 25% of students in terms of socio-economic status and their associated error margins. In other words, this information represents the result of the average school in a country or economy.

A similar methodology is followed when student quartiles are presented (i.e. when comparing the highest- and lowest-performing students from Your School in each domain to their global peers). In this case, the student scores that represent the top and bottom quartiles of performance (the scores above and below which 25% of students are found) in each domain are identified within each school in a country or economy. These scores are then averaged across all schools in the respective country or economy to produce within-schools, country-level results in each domain for these same performance percentiles.

Figures 3.6, 3.7 and 3.8 of the School Report focus on equity, with special attention to the results of specific groups of students within Your School. Thus, they will primarily compare Your School’s results with within-schools results, and not within-country results. This distinction is clearly identified in the text.

Continues

Data selection and average scores Certain restrictions on the PISA 2018 data were made in order to allow for accurate within-schools computations. To be included for such analyses, schools must have had at least 20 students tested and 80% of the tested students must have reported information about their socio-economic status. For analyses related to gender, the data were further limited by excluding single-gender schools. Finally, for a country's results to be reported, at least 50% of its schools must be eligible after the aforementioned criteria were applied. Due to these measures, the within-schools average scores for countries and economies will differ between analyses, as the number of schools used to produce each set of results differs slightly. Furthermore, the within-schools country-level results will differ from the within-country results that appear elsewhere in this report and in PISA 2018 reports.

Considerations Due to the way in which within-country and within-schools results are produced, it is useful to understand how they might be influenced by different factors and what types of results should be expected. Importantly, the range of student performance within a single school is usually smaller than the range of student performance within a country or economy. Thus, achievement gaps according to the highest- and lowest-performing students in a school (expressed as scores corresponding to quartiles) tend to be smaller when looking at within-schools results for a country or economy compared with within-country results. Similarly, within-schools variance according to socio-economic background (expressed as average scores) also tends to be smaller than within-country variance, as a single school's population rarely represents the entire range of socio-economic status within a country or economy. Finally, purposeful sorting of students into schools can strongly affect within-schools results across countries and economies. If students are sorted into schools based upon ability, students who attend the same school will perform similarly. In this case, the within-schools achievement gap will therefore be smaller relative to other entities. Nevertheless, the within-country achievement gap for this country or economy could be large relative to other entities.

Figure 3.9 of the School Report: How Your School's results in reading compare with schools in Your Country in PISA 2018

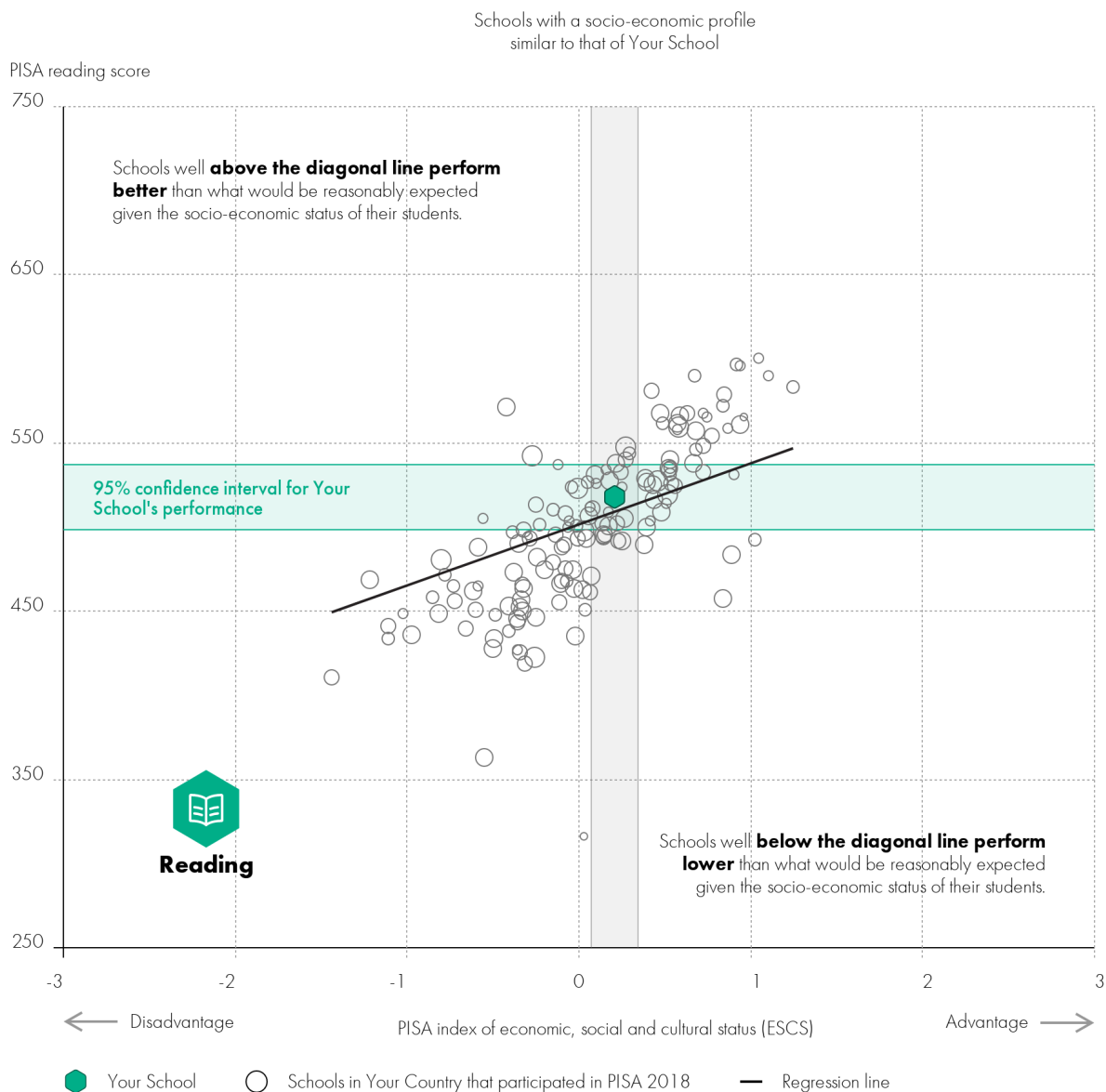


Figure 3.9 of the School Report shows Your School's average performance in reading along with the results of other schools in Your Country that participated in PISA 2018. The green hexagon (at the centre of the vertical and horizontal stripes) represents Your School, while the hollow bubbles represent other schools in Your Country.

The scale on the bottom (the x-axis) refers to the socio-economic status of students as measured by the PISA **index of economic, social and cultural status (ESCS)**. For more information on the ESCS, please refer to page 11. The important element to keep in mind when reviewing this figure is that as values increase (from left to right), the average socio-economic status of schools increases (i.e. they are more advantaged in terms of their socio-economic background). Thus, schools that are plotted toward the lower end of the scale (-2.0 for example) will appear on the left side of the figure, and one may conclude that students in these schools come on average from disadvantaged backgrounds. Schools plotted with higher ESCS values such as +1.0 or higher (toward the right side of the x-axis) serve students who are primarily from advantaged backgrounds.

Schools with a **similar socio-economic background** to yours fall within the boundaries of the vertical **grey** stripe. Schools with a similar reading score to yours fall within the boundaries of the horizontal **green** stripe.

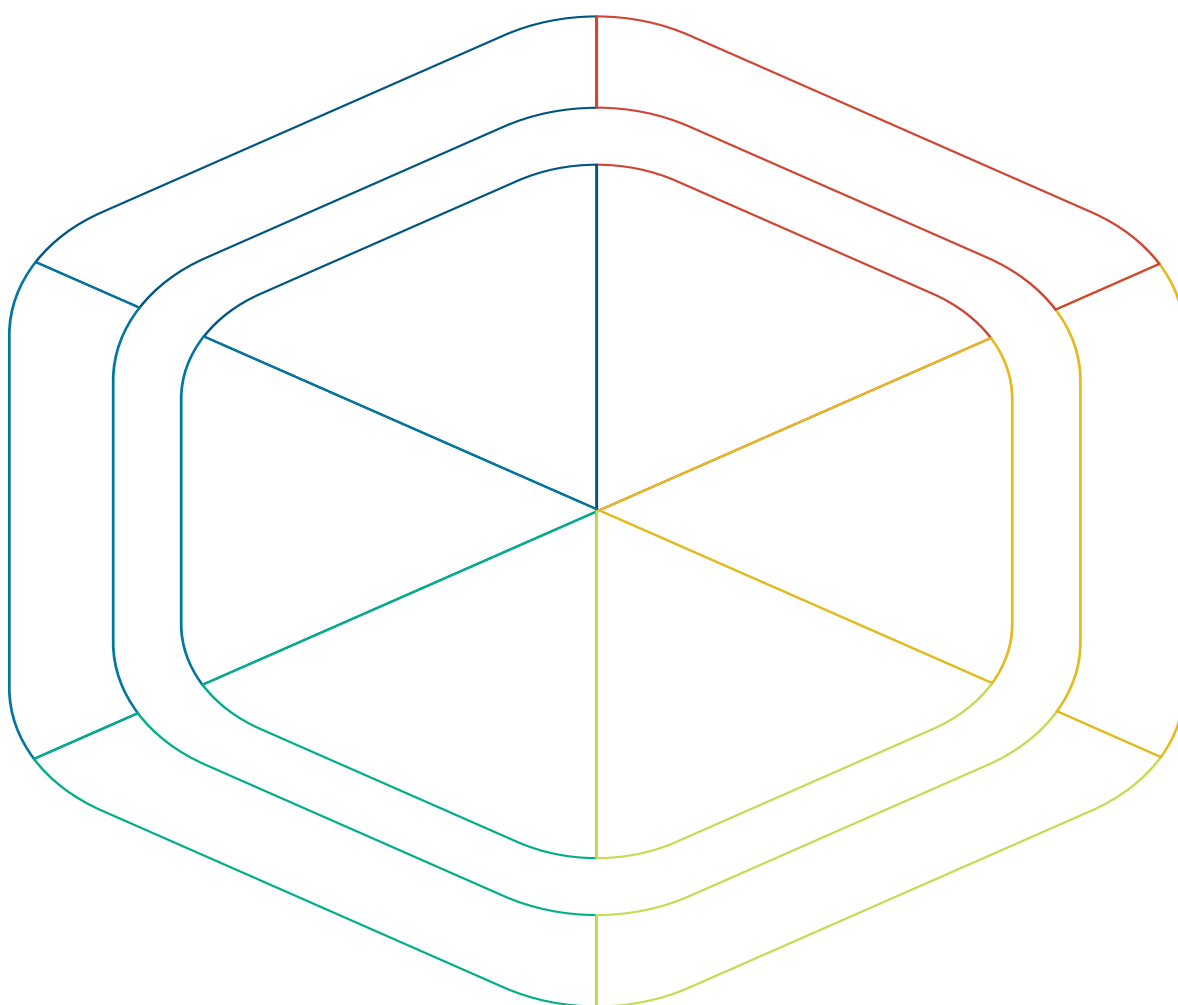
With this information in mind, it is now useful to see whether other schools that fall within the vertical grey stripe are performing above or below Your School level. Schools within the grey stripe that are above the horizontal green stripe have students with a similar background to yours but show a higher student performance than Your School. Similarly, schools within the grey stripe that are well below the horizontal green stripe have students with a similar background to yours but show a lower student performance than Your School.

The diagonal line on the figures indicates the regression line, which represents the relationship between socio-economic background and reading performance observed in the schools that participated in PISA 2018 in Your Country. Schools well above the diagonal line perform better than what would be reasonably expected given the socio-economic status of their students. Schools well below the line perform lower than what would reasonably be expected given the socio-economic status of their students.

Whether Your School is **well above** or **well below** the diagonal line can be used as an indication of the effectiveness of Your School compared with others across the country. For example, if student performance of Your School is below average for Your Country but students from Your School come from a relatively disadvantaged background, Your School could still show results that are better than expected given the background of the students. In that case, the green hexagon representing Your School will be well above the diagonal line. On the other hand, if Your School performs above average but most of your students come from advantaged backgrounds, it is relevant to consider whether the relatively high performance for Your School can be primarily attributed to the students' socio-economic background. If Your School is well below the diagonal line, then its performance is lower than what would be expected on average among schools in Your Country given similar students.

A simple way to identify whether Your School's results can be considered as statistically below or above what would be expected given its students' socio-economic background is to follow the following rule:

- *If Your School is above the diagonal line:* Look at the green stripe around Your School's performance and find the lower border of the green stripe, right beneath the green hexagon that represents Your School. If beneath the green hexagon the lower border of the green stripe is above the diagonal line, then Your School's performance is **significantly above** what would be expected.
- *If Your School is below the diagonal line:* Look at the upper border of the green stripe, right on top of the green hexagon that represents Your School. If the upper border is below the diagonal line, then Your School's performance is **significantly below** what would be expected.



How to read a bubble chart?

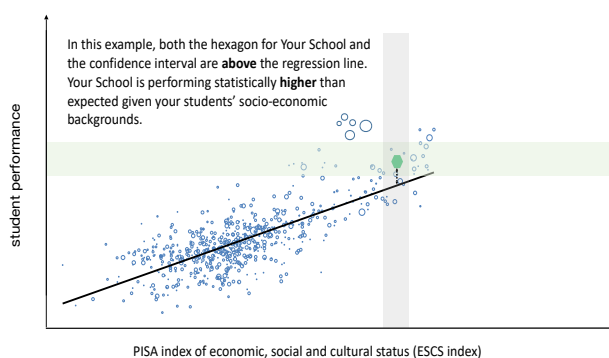
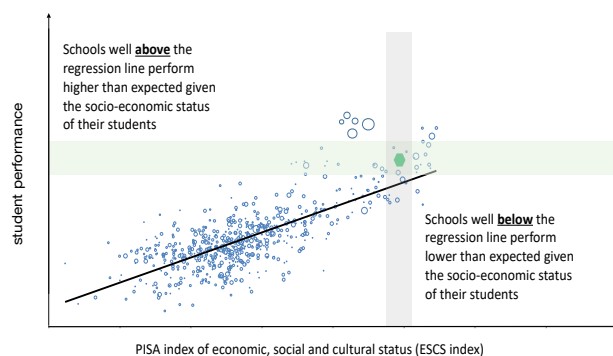
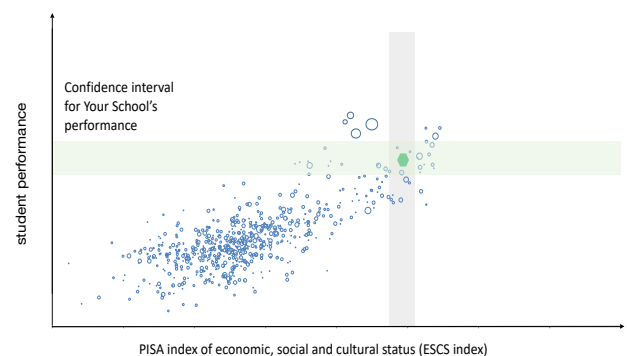
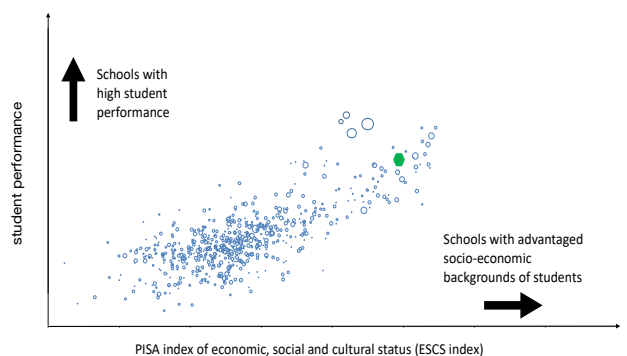
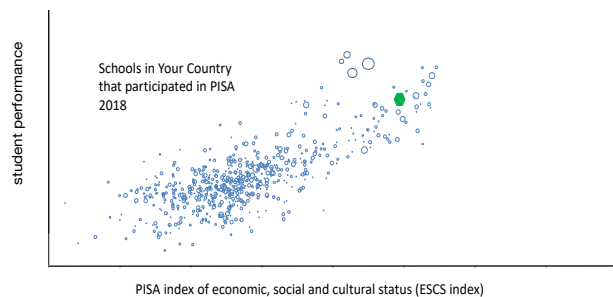
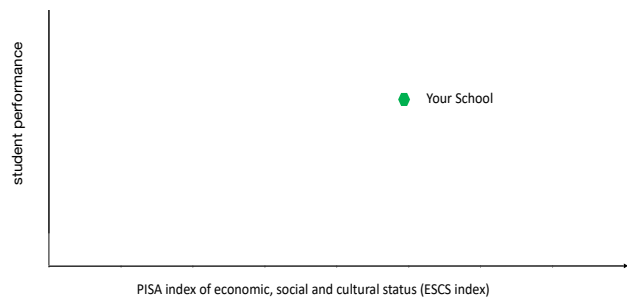
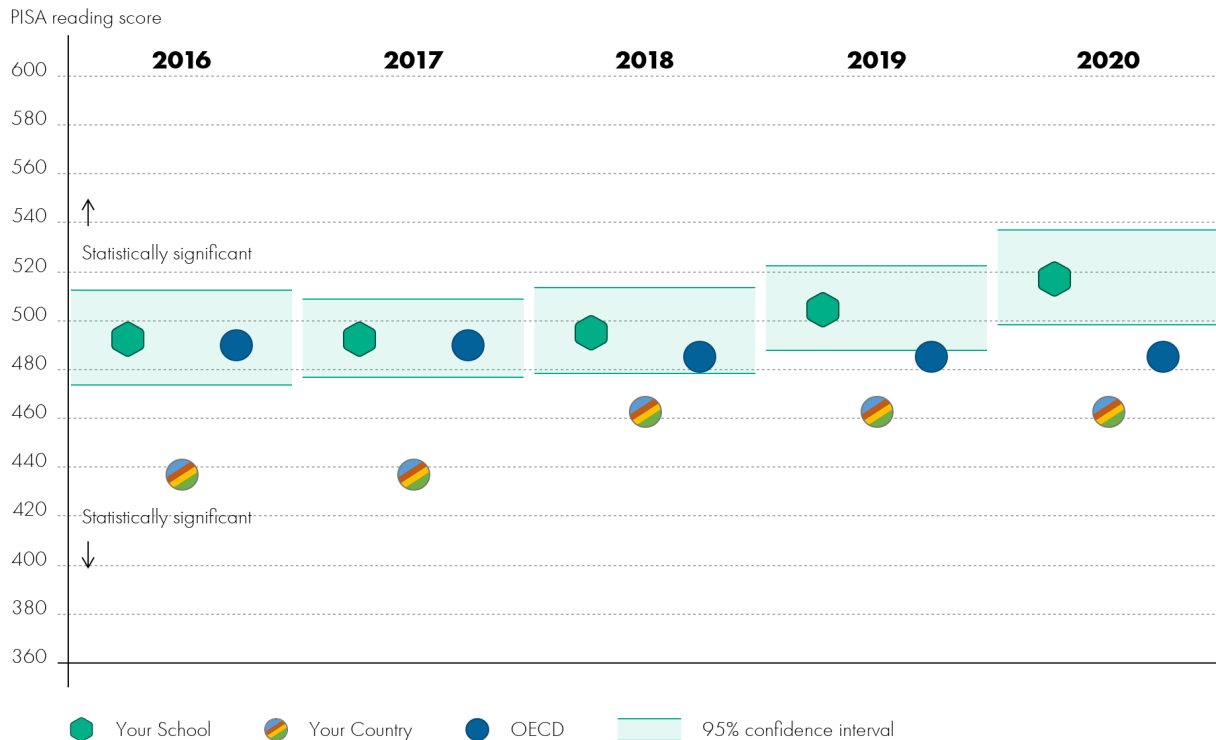


Figure 3.12 of the School Report: Trends in student performance in reading (with 95% confidence interval for Your School)



As some schools may take the PBTS multiple times, Figure 3.12 of the School Report shows the reading performance of Your School in different years.

Under each year, you can see three markers. The green hexagon represents the average performance of Your School in that particular year. The flag represents the PISA score for Your Country in that year, while the blue circle shows the average performance of all OECD countries in that same year.

Please note that the PISA test is administered every three years, which represent what we call a PISA cycle. As a consequence, the score of Your Country and the OECD average remain unchanged within the same PISA cycle. For information, the latest PISA test was administered in 2018, and the next one is planned for 2021.

The semi-transparent green stripe indicates the 95% confidence interval of the performance of Your School for each year. Across years, this may vary. Yet, the difference between two years is statistically significant only if the green stripes of the two years do not overlap. For more information on confidence intervals, please refer to page 48.

Figure 4.1 of the School Report: Student motivation for learning science (students *strongly agree* or *agree*)

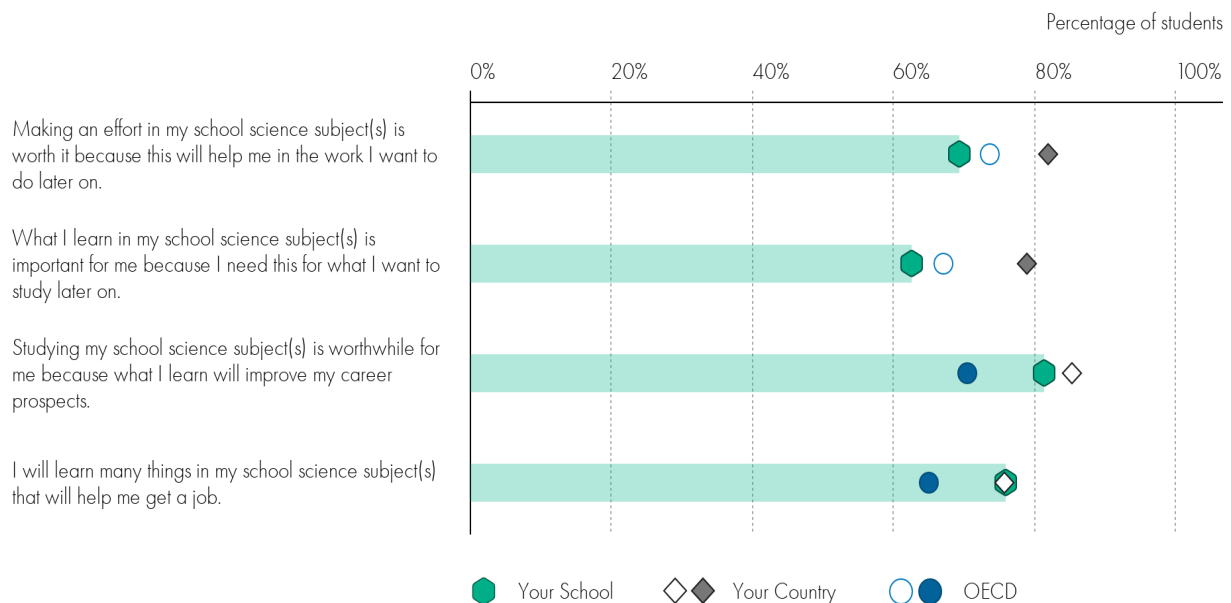


Figure 4.1 of the School Report shows how students at Your School responded to a question regarding their motivation for learning science. The question focused on how important they saw science for their own lives as they moved on to further studies and the labour market. In order to assess this, students were presented with four statements about their motivation for learning science. The values in the figure represent the percentage of students who agreed or strongly agreed with each of the statements.

The green bars and the green hexagons represent the percentage of students at Your School who agreed or strongly agreed with each statement. The tilted squares and the blue circles show the same percentage for Your Country and the OECD, respectively, in PISA 2018.

If the tilted squares or the blue circles are filled, this indicates that the values for Your Country or the OECD average are significantly different from those of Your School. For more information on confidence intervals, please refer to page 48.

Figure 4.2 of the School Report: Student beliefs in their own self-efficacy in science, at Your School and for the highest- and lowest-performing students (students believe they can perform the task *easily or with a bit of effort*)

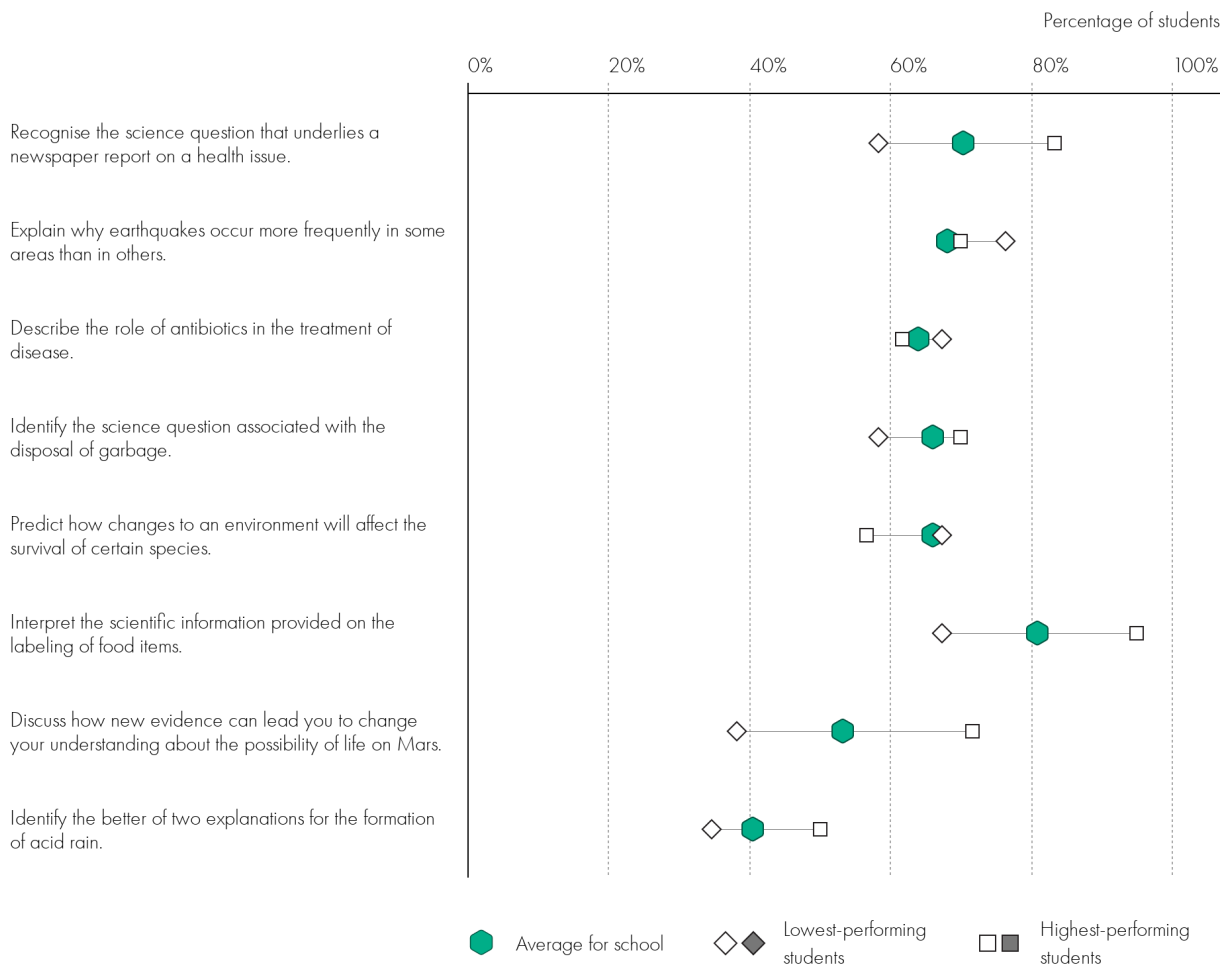
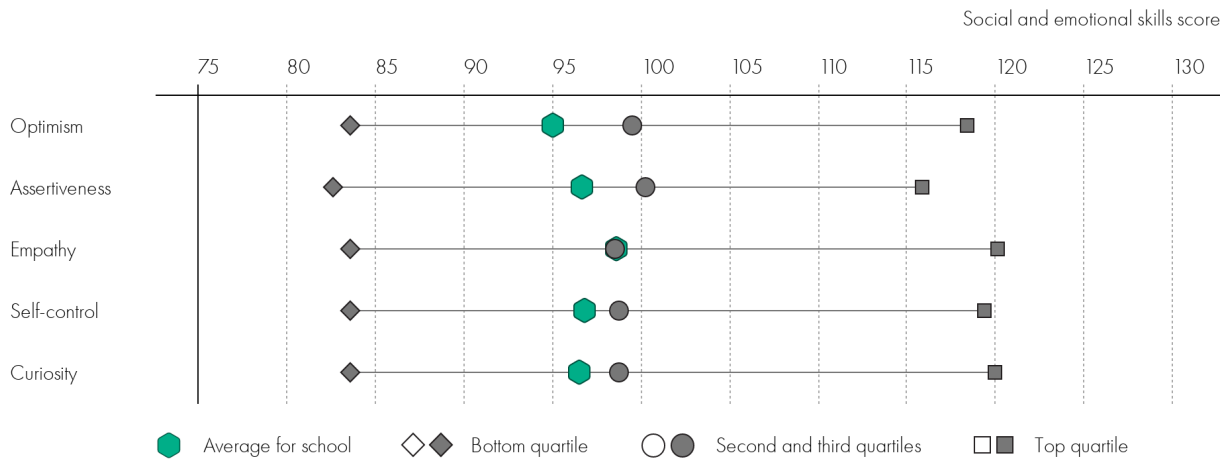


Figure 4.2 of the School Report shows how students at Your School responded to a question regarding their self-efficacy in science. In order to assess this, students were asked how confident they felt about having to do each of the science tasks mentioned in the figure.

The values in the figure represent for each task the percentage of students who responded they could perform it easily or with a bit of effort. The green hexagon represents the average value of your school. Furthermore, to illustrate the relationship between self-efficacy in science and performance in science, responses for the highest- and lowest-performing student quartiles from Your School are shown by squares and tilted squares.

If squares and tilted squares are filled, this indicates that the responses of the highest- and lowest-performing student quartiles are significantly different.

Figure 5.1 of the School Report: Social and emotional skills in each of the Big Five dimensions, at Your School and in the different quartiles of all PBTS schools in Your Country to date



Note: statistically significant differences are shown by filled shapes.

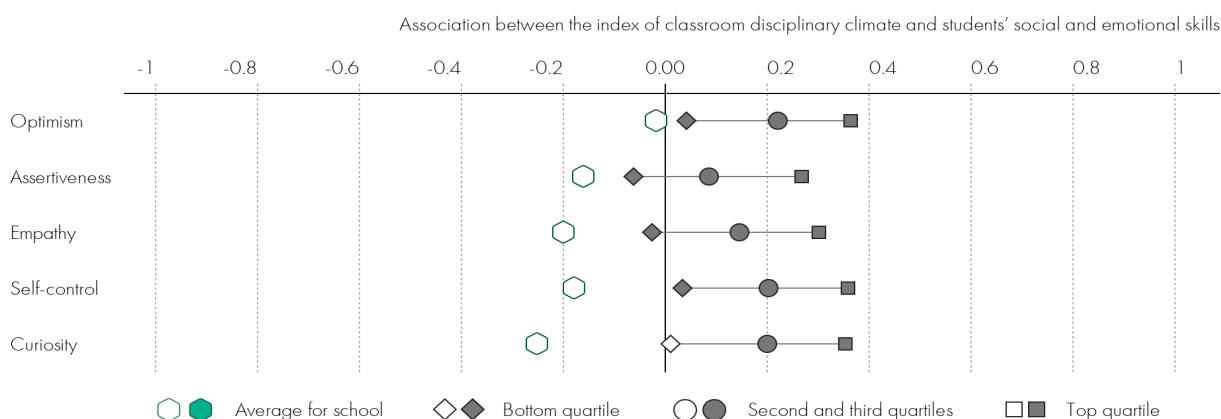
Figure 5.1 of the School Report illustrates the average scores in the five social and emotional skills assessed by the PBTS for the students at Your School. These are also compared with those of students in all the other schools that took the PBTS in Your Country to date.

The results are reported on a country-specific standardised scale, that is built on the data of all the schools that took the PBTS in Your Country to date. In this scale, higher values indicate higher levels of any of the skills. For each skill, the figure shows the value of Your School with a green hexagon. Furthermore, it also shows the average value for each skills across the bottom 25% of the schools taking the PBTS in Your Country to date, represented by a tilted square; the mid 50% of these schools, represented by a circle; and the top 25% of these schools represented by a square.

If a tilted square, a circle or a square are filled, this indicates that the value for its respective group is significantly different from that of Your School.

For more information about the definition of each skill, please refer to page 28.

Figure 5.2 of the School Report: Relationship between the index of classroom disciplinary climate and students' social and emotional skills, at Your School and in the different quartiles of all PBTS schools in Your Country to date



Note: statistically significant differences are shown by filled shapes.

Figure 5.2 of the School Report illustrates the strength of the association between the index of disciplinary climate and each of the five social and emotional skill measured by the PBTS. The figure shows the value of this relationship for Your School (with a green hexagon) and for groups of schools with different levels of each skill. For each of the skills, in fact, the figure sorts all schools according to the value of the skills, it groups the bottom 25%, mid 50% and top 25% of the schools and then shows the strength of the relationship between the index of classroom disciplinary climate and the skill for each group. The markers for each group are a tilted square, a circle and a square, respectively.

The strength of these relationships are measured as semi-partial correlations, which can vary between -1 and +1. The former case indicates a perfectly negative association (i.e. increases in the index of disciplinary climate are associated with a decreases in the social and emotional skills values) and the latter case indicates a perfectly positive association (i.e. increases in the index of disciplinary climate are associated with increases in the social and emotional skills values). Values near zero indicate a very weak or absent associations between the two quantities.

If any marker is filled, this indicates that in that case the relationship is significantly different from zero.

You will notice that in the text it is mentioned that the strength of the relationship is presented after controlling for the effect of students' socio-economic status and other demographic differences. This means that all the possible confounding effects of variables such as gender or socio-economic background have been removed thanks to the use of advanced statistical models.



5. WHAT ARE THE KEY STATISTICAL CONCEPTS USED IN THE SCHOOL REPORT?

In this section, you will find concise explanations for all the key concepts and terms that you may come across while reading the School Report.

What key statistical terms does the School Report use?

Rounding figures

Rounding figures consists of putting a number up or down to the nearest whole number (or another agreed quantity). Because of rounding, some values in figures might not exactly add up to the totals (e.g. percentage may add up to 101% or to 99%, instead of 100%). However, totals, differences and averages are always calculated based on exact numbers and are rounded only after calculation.

Average

The average, also called arithmetic mean or mathematical expectation, is the sum of a collection of numbers divided by the count of numbers in that collection.

OECD average

The OECD average refers to the average of the country-level estimates for all countries that make up the OECD. In PISA 2018, this corresponded to the average of 36 countries plus Colombia (which was still in the process of completing its domestic procedures for ratification).

Standard deviation

The standard deviation is a measure of the amount of variation or dispersion of a set of values. A low standard deviation indicates that the values tend to be close to the average, while a high standard deviation indicates that the values are spread out over a wider range.

Quartiles

Quartiles divide a number of observations into four groups of the same size, based on the sorted distribution of a variable of interest. The first quartile (also known as the bottom or lower quartile) groups the lowest 25% of all observations. The second quartile groups all the observations falling above the 25% lowest observations but below the 50% of all observations. The third quartile groups all the observations falling above the 50% lowest observations but below the 75% of all observations. The fourth quartile (also known as the top or upper quartile) groups the highest 25% of all observations.

Sampling and measurement errors

The aim of a school-level assessment such as the PBTS is to generalise the results based on samples to the larger target population. The sampling method ensures not only that the samples are representative and provide a valid estimate of the population average score and distribution, but also that the error due to sampling is reduced to a minimum. The sampling error decreases with the number of students included in the assessment.

The use of a limited number of items to assess broad domains introduces some measurement uncertainty: would the use of a different set of items have resulted in different performance? This uncertainty is quantified by the measurement error. This type of error decreases with the number of items that underlie a proficiency estimate in a domain. It is therefore larger for individual students (who only see a fraction of all test items) than for school averages (which are based on all test items). It also decreases with the amount of background information available.

All figures in the School Report account both for the sampling and the measurement errors.

Confidence level

The results of the PBTS consist of estimates because they are obtained from samples of students – rather than from a census of all students – and because each student is presented with a limited set of assessment tasks, not with all the tasks included in the PBTS. As a result, these estimates bring with them some uncertainty, which is exemplified by the confidence level of the estimate.

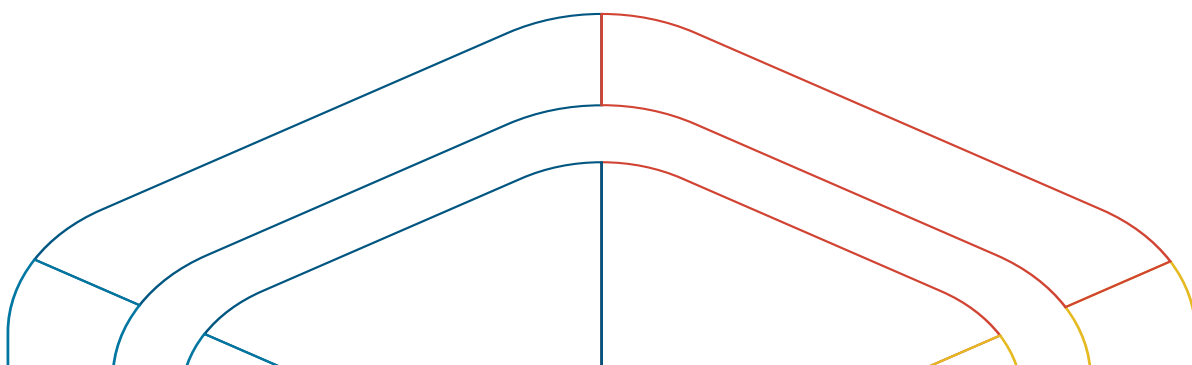
As a rule, PISA reports estimates with a 95% confidence level, a convention that has been followed in the PBTS School Report. In the case of the estimate of a difference, for example, this implies that if the measurements were to be replicated several times, a difference of that size would be observed about 95% of the time.

In terms of aggregates (such as countries and the OECD), the School Report shows only point estimates. While these scores are also subject to a certain degree of uncertainty, this has been omitted from the visual representation of the data given that they are being used as benchmarks. Nonetheless, all of the significance tests used for data presented in the report fully account for their inherent uncertainty.

Confidence interval

Every estimate in the School Report comes with a confidence level (see above). The confidence interval represents the range of values that an estimate may take depending on its specific confidence level. As a rule, the higher the confidence level, the wider the confidence interval will be.

In technical terms, the confidence interval represents the 95% certainty with which an estimate will lay within its range, were the test to be replicated several times with different student samples in your school.



Statistically significant difference

A difference is statistically significant if it is unlikely that such a difference could be observed in samples when in fact no true difference exists in the populations from which the samples are drawn. This unlikeliness directly depends on the confidence level of the estimates, and a statistically significant difference occurs when the confidence intervals of two estimates do not overlap. In other words, it is a difference that is unlikely to occur by chance.

Regression line

The regression lines presented in the School Report allow visualising the relationship between the variables described in the vertical and horizontal axes. The lines represent the expected value for one of the two variables given a specific chosen value for the other variable.

Strength of a relationship between variables

In the School Report, the strength of the relationships between variables is measured through semi-partial correlations.

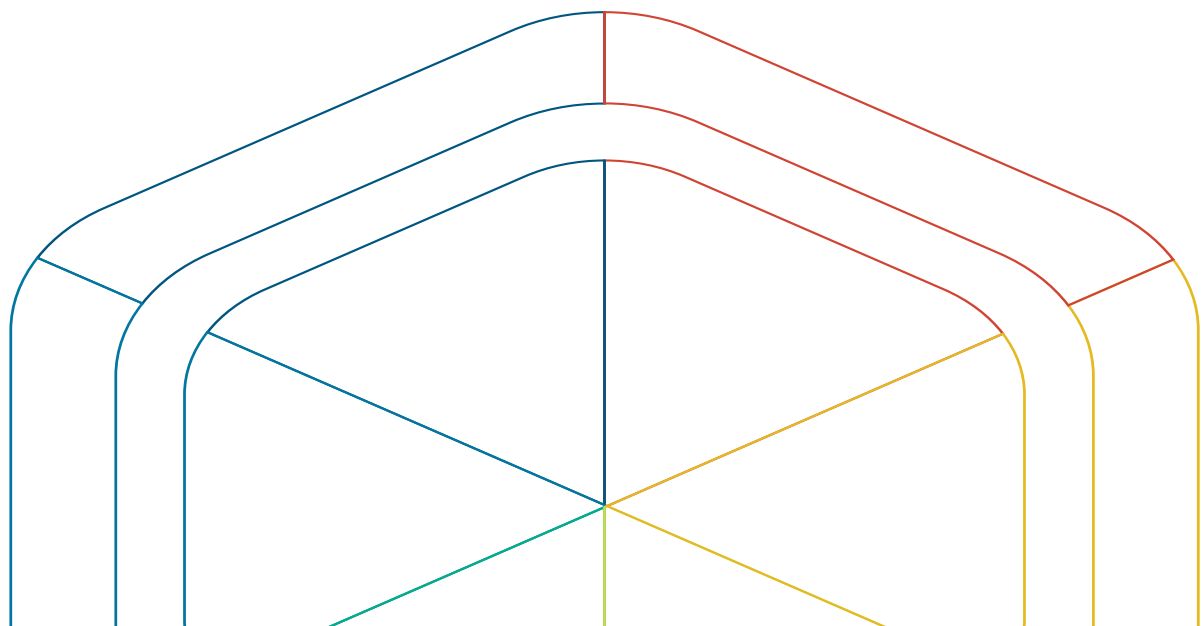
Controlling for the effect of other variables

In the School Report, the strength of the relationship between two variables is always presented after controlling for the effect of students' socio-economic status and other demographic differences. This means that the relationship that is shown is "net" of the effect that socio-economic status and other demographic differences could have.

In other words, this means that all the possible confounding effects of variables such as gender or socio-economic background have been removed thanks to the use of advanced statistical models.

Small samples

Focusing the analysis at the school level necessarily implies working with relatively small numbers of students. As a consequence, in some cases a sub-group of students being analysed may consist of only a handful of people (e.g. boys in a school that is mainly attended by girls). In these instances, we recommend caution in drawing any conclusion when looking at these results for sub-groups, as their estimates will be based on only a few cases. Throughout the report, thus, a note will appear under any figure to indicate whether one or more sub-groups in that figure consist of too few students to give reliable conclusions.



What abbreviations are used?

Some abbreviations are used throughout the School Report, including:

ESCS	PISA index of economic, social and cultural status
NSP	National Service Provider
OECD	Organisation for Economic Co-operation and Development
PBTS	PISA-based Test for Schools
PISA	OECD Programme for International Student Assessment

Where can I find further information?

Numerous active hyperlinks are included throughout the Reader's Guide and the School Report. They include additional resources that include relevant reports, websites and other material on the PBTS, PISA and other OECD works.

Below is a selected list of useful links to explore the PBTS and PISA more fully:

The OECD PISA for Schools homepage:

<http://oecd.org/pisa/pisa-for-schools/>

The PISA for Schools Online Community:

<https://oecdphisaforschools.org>

The PISA for Schools Technical Report:

<http://oecd.org/pisa/pisa-for-schools/>

The PISA volumes:

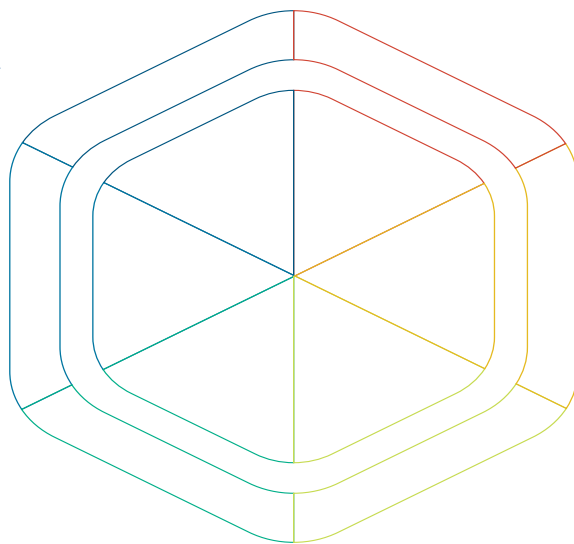
<http://www.oecd.org/pisa/publications/>

The PISA database:

<http://www.oecd.org/pisa/data/>

The PISA in Focus series:

<http://www.oecd.org/pisa/publications/pisainfocus.htm>



Organisation for Economic Co-operation and Development

The OECD is a unique forum where governments work together to address the economic, social and environmental challenges of globalisation. The OECD is also at the forefront of efforts to understand and to help governments respond to new developments and concerns, such as corporate governance, the information economy and the challenges of an aging population. The organisation provides a setting where governments can compare policy experiences, seek answers to common problems, identify good practice and work to co-ordinate domestic and international policies.

The OECD member countries are: Australia, Austria, Belgium, Canada, Chile, Colombia, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Japan, Korea, Latvia, Lithuania, Luxembourg, Mexico, the Netherlands, New Zealand, Norway, Poland, Portugal, the Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Turkey, the United Kingdom and the United States. The European Commission takes part in the work of the OECD.

OECD Publishing disseminates widely the results of the organisation's statistics gathering and research on economic, social and environmental issues, as well as the conventions, guidelines and standards agreed by its members.

PISA for Schools

Reader's Guide to the School Report : How Your School Compares Internationally

How prepared are the 15-year-old students in Your School to thrive in the 21st century? Have they acquired the skills needed to succeed in higher education, the workplace and society? If your school has conducted the PISA-based Test for Schools and is eligible, you will have received a School Report that allows you to compare your students' levels of proficiency in reading, mathematics and science with the levels of other students in your country and in the OECD, as measured on the PISA scale.

This Reader's Guide is designed as a companion volume to help you explore your School Report and navigate the rich data provided by the PISA-based Test for Schools. It contains useful background material as well as detailed explanations on how to interpret the figures and charts found in your School Report. This Guide may also be useful to educators and decision-makers interested in the key concepts, methods and approaches used in competence-based assessments, such as PISA and the PISA-based Test for Schools.

Understanding data is just the first step. What counts more will be how you apply the insights gained from your data when developing concrete actions to improve teaching and learning in Your School.

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Chapter 3.	What is PISA for Schools?
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